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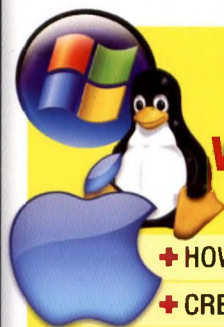


SONY'S 25-MEGAPIXEL A900 DSLR



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gPHONE vs iPHONE

The first Google-powered phone is about to end the iPhone's honeymoon.

+ WE TEST iPHONE CHALLENGERS FROM NOKIA, SAMSUNG, PALM AND MORE!



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NETWORKING: GO BEYOND THE MANUAL

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editorial



TONY SARNO

A letter on our Epinions pages this month sums up what I've thought for some time: that the big mobile phone makers, like Nokia, could see Apple coming a mile away with its iPhone and did little to stop the juggernaut with comparable technology of their own. Maybe the explanation lies in the arrogance of market share. Nokia has about 40 per cent of the world's mobile market, to Apple's less than 1 per cent so far — so maybe Nokia felt it could sit back and study the impact of the iPhone before making its move.

But what's delightful about technology is that just when you think you've got something covered, along comes a disruptive force that can put you out of business. In smartphones, that disruptive force is Google and its Android OS. The reason Android is so potentially threatening to traditional phone-makers is that it's designed from scratch to tie your mobile into the internet — the universal communications and content platform into which Google has inserted its tentacles further than anyone else.

iPhone users have shocked the local 3G mobile broadband providers with their extraordinarily high amounts of internet surfing and downloads. Telstra BigPond officials were telling me this week that people actually, seriously, like to watch movies and sport such as football and car-racing on tiny screens — and Telstra has the figures to back it up.

This just highlights that latent market for the next phase of computing — the inevitable transfer of your applications and storage from your desktop and prone-to-fail PC to the cloud. I have no doubt that in a few years your entire computing identity will live online and be accessible from wherever you are from any number of devices. The cloud will work brilliantly through a smartphone, and the most attractive platform will be the one that provides the deepest links into cloud-based resources. Nokia and Apple, who want control over their hardware and OS, and thus would never license Android, have nothing to match Google's range of online applications and ambitions.

Our cover story on gPhone vs iPhone, by Alexander Gambotto-Burke (page 54), provides an insight into the thinking behind Android, as well as the kinds of applications that are being created specially for it by third parties. As well, we've looked at current challengers to the iPhone, including the just-released Nokia N96. This is probably the last of Nokia's pretend challengers to the iPhone — as reviewer Jenneth Orantia points out, it's good but it's no iPhone. In fact, by the time you read this, Nokia should have announced a touchscreen phone that's much more like the iPhone: the Nokia Tube.

Regardless of who wins the smartphone wars, another exciting chapter in computing has begun.



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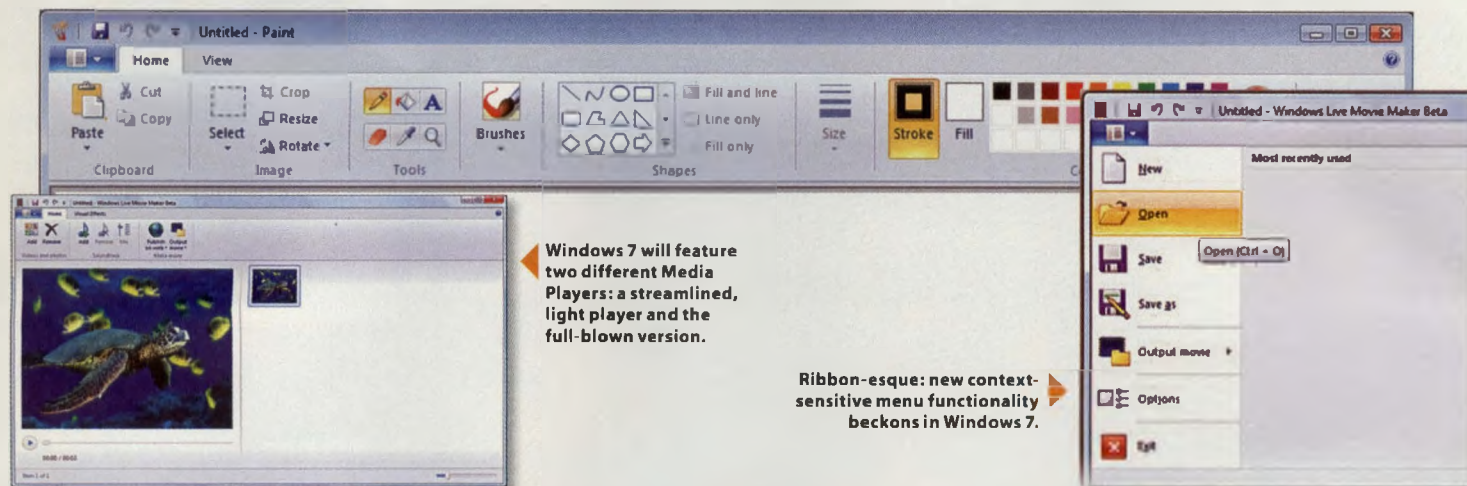


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Windows 7 will feature two different Media Players: a streamlined, light player and the full-blown version.

Ribbon-esque: new context-sensitive menu functionality beckons in Windows 7.

WINDOWS 7

USHERS IN RIBBON INTERFACE

As Windows 7 heads towards its first beta release, leaked copies of early builds show that the Microsoft successor to Vista features some radical changes.

Windows 7 will incorporate the Office 2007 ribbon as part of the Windows 7 user interface. Both Paint and WordPad swap pull-down menus for a morphing context-sensitive toolbar (the ribbon-esque UI element itself is rumoured to be called 'Scenic', as opposed to Office 2007's 'Fluent' architecture). The ribbon is of course the handiwork of Julie Larson-Green, who led the radical overhaul of Office 2007's UI before heading Windows 7's UX (User experience) team.

In a controversial move, Windows Mail (formerly Outlook Express), Photo Gallery and Movie Maker will all be scrapped from the Windows 7 codebase. In their place, users will be asked to download the equivalent package from Microsoft's Windows Live suite.

The risk is that this makes a fresh out-of-the-box Windows 7 PC less immediately useful than a Mac — or

for that matter a Windows XP or even Windows 9x machine. Microsoft's gamble is that sufficient users have the necessary broadband internet connection and incentive to click a link on their Windows 7 desktop and not just download those programs but start using these and other Windows Live services for email, sharing photos, calendaring, instant messaging, blogging and the like.

One small step forward is the appearance of new apps such as Sticky Notes for the desktop plus a slimmed-down Media Player designed for fast load times. (The full-blown Windows Media Player 12 remains present in the background.)

Then there are minor cosmetic tweaks. The Documents master folder becomes the Library, which contains folders for Documents, Pictures, Music, Movies and Downloads. The Calculator gains

Programming and Statistics modes, along with unit conversions.

Windows 7 will also fix some Vista features that annoyed users. One of the more obvious characteristics of the Start menu in Vista was burying the options for shutdown and restart in a tiny fly-out menu, while making the sleep button much more prominent. In a post on his Engineering Windows 7 blog, Microsoft core user experience program manager Chaitanya Sareen effectively admits that this plan backfired and confused users.

Other improvements may include changes to the taskbar area, which is one of the most widely used features of the Windows interface. While Sareen largely shied away from specifics, other key elements in the plan have emerged.

One is getting rid of the endless pop-up notifications that appear in Vista. "Based upon the feedback

we've collected from customers, we recognise the Notification Area could benefit from being less noisy and something more controllable by the end user."

Another is cleaning up the taskbar. "The taskbar is almost 15 years old, everyone uses it, people are used to it and many consider it good enough," Sareen noted. However, on powerful PCs running lots of apps, it can still get crowded. Thus another key design goal: "The taskbar should have a cleaner look and feel." This ties in with Microsoft's previously announced intentions to cut down on the amount of third-party 'crapware' visible in Windows.

Some other features of the Windows desktop are likely to remain but won't get much emphasis in terms of future development or planning for integration with new features.

David Flynn and Angus Kidman

THE (A)PC REVOLUTION

November 1993



ARE PDAs READY FOR PRIME TIME?

Technically impressive, Apple's Newton MessagePad and the Tandy/Casio Zoomer are the first true Personal Digital Assistants. Their potential is tantalising, but the reality leaves something to be desired. Prices are high, handwriting recognition marginal, and communications incomplete. Yet, with technology advances, PDAs may yet fulfill their original vision.

MICROSOFT EXCEL 5.0 GETS SMART

Excel 5.0 introduces many novel user-friendliness features, which Microsoft is touting as a new kind of spreadsheet "intelligence" called IntelliSense. IntelliSense, which Microsoft is adding to applications such as Word 6.0 for Windows and PowerPoint 4.0, senses what you want to do, to help make routine and complex tasks easier to automate and complete.

Users will [also] see a more intuitive multi-sheet interface in Excel 5.0. Following the lead of Quattro Pro for Windows, Excel displays a tabbed index for its workbook, which happens to be the new default-document type. Not only can you name these page tabs, but you can also move them. . . That's an advantage over Lotus 1-2-3 for Windows' fixed-page structure.



SONY'S NEW 25-MEGAPIXEL DSLR

It's getting ridiculous. Sony's newest DSLR comes with a 24.6-megapixel sensor — and a price tag to match.

Sony's a900 joins the elite club of DSLRs that feature a full-frame sensor exactly equivalent to that of a genuine 35mm film camera. It also boasts the highest megapixel resolution of any full-frame DSLR ever, at a whopping 24.6MP. Just the thing for taking photos of the moon — and then printing them at a 1:1 ratio.

In practical terms, a 24.6-megapixel resolution means your photos will be 6,048 x 4,032 pixels at highest resolution, 4,400 x 2,936 at medium size, and a puny 3,024 x 2,016 in the small size.

Sony's also touting the a900 as being particularly sensitive to vibration, with an inbuilt anti-shake system in the camera body. Sony dubs it with its own name, "SteadyShot", and claims that the a900 has four levels of anti-shake correction on board and will even use the same mechanism to shake dust off the sensor every time the a900 is powered down.

The a900 features not only a full-frame sensor but also a full-frame optical viewfinder, so that (so Sony claims) what you see is exactly what you'll shoot. Autofocus comes with a dual-cross nine-point AF system, and a variety of creative shooting modes are available. The a900 is both Memory Stick and CompactFlash compatible, and Sony reckons you'll be able to fire off "approximately" 880 images with a fully charged battery.

One area where the a900 could be seen as a touch limited is in ISO sensitivity, where it tops out at ISO 6400. While competing models go much higher, there's often either a loss in resolution, or a jump in noise, making higher models technically capable but functionally useless. It'll be interesting to see how the a900 competes.

You can drool over the a900's full specs, but don't ask us how you're going to afford one. Leaving aside any lens that you might want to stick on it, you'll be looking at getting one dollar's change out of four-and-a-half grand.

Alex Kidman

HE SAYS...



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THE RAT-BRAINED ROBOT

Scientists at the University of Reading have created a robot that really can think for itself.

Although it might look like any other small robot, the machine created by researchers at Reading University is radically different from any other existing machine. That's because it's controlled not by software, but by 300,000 living neurons.

Rather than being a nightmarish vision of the future, the intention of the project is to understand how memory works.

"This is really exciting because we can put the robot into different situations and see how the memories that the robot has actually appear in the brain," says team member Professor Kevin Warwick.

BUILDING THE BRAIN

The team took the brain stem from a rat foetus and separated individual cells using an enzyme that breaks the connections between them.

When placed in a bath of nutrients, the neurons began reaching out to form new connections. After a while, the signals passing between them were strong enough for the electrodes to detect.

So what happens next? "That electrical activity goes through fairly complex processing steps, which ultimately drive the robot's speed of movement, the speed of its wheels and the direction in



The Reading University robot that's controlled by a rat's brain (consisting of 300,000 living neurons).

which it turns," explained team member Dr Ben Whalley.

This information is then transmitted to the robot's hardware. Each side of the machine has ultrasonic sensors that feed information about the surroundings back to the computer. This information is being fed into the living neural network. "Information is coming out and information is being fed back in, and the interaction between the two goes round and around to form this closed loop," says Whalley. "And it's by this means that we hope that the robot will



Proving to be a popular robot on the big screen at the moment, could a real life WALL-E be the result of this mind-numbing research? Or will the researchers be the ones to look like wallys?

actually learn to perform meaningful functions."

LEARNING BY DOING

"We're really getting to the exciting stage of the project where we can try and teach the robot how to behave," adds Warwick. "But already what's amazing is with the robot going through particular procedures, coming to the wall, avoiding an object, and doing that repetitively, it's actually learning. The neuron links are strengthening just from the habit the robot has of doing something repetitively. We don't even have to tell it.

It's improving as it keeps doing something."

Having an understanding of how memories form in the brain is the key to fighting back against the devastation caused by neurological diseases such as Alzheimer's. "One of the fundamental questions that neuroscientists are facing today is how we link the activity of individual neurons to the complex behaviours we see in whole organisms and animals," says Whalley. "Hopefully we can use that to go some way to answering some of these very fundamental questions."

GOOGLE CHROME

Google's new Chrome browser has taken the net by storm. APC spoke to Google's Vice President of Product Management, Sundar Pichai.



Q Can you take us through the basics of what Chrome offers compared to other browsers?

A We have streamlined the user experience — and we have minimised the “chrome” around the browser. We have reinvented search and navigation — the two most common things people do in a browser — by combining them both into one bar, along with an automatically generated page showing your most popular bookmarks and recent history when you open a new tab.

We are using WebKit, which is an open source rendering engine — the same one as Safari. As long as a web site works in Safari it works in Chrome as well.

We've used a multiprocess architecture which fundamentally improves the browser. Each tab runs in its own environment so if one tab crashes it doesn't take the browser down.

In terms of security, even if malware comes down onto your machine it can't read or write to the machine.

The final piece of technology in Chrome is V8. Your browser needs to execute JavaScript to get many web pages to run. V8 is an order of magnitude faster than what you see in other browsers.

If a tab is inactive we don't consume a lot of resources. It is very fast and very responsive all of the time — you just never have an unresponsive feel to the browser.

Q One of the best things about Firefox is the hundreds of different add-ons that make it an infinitely customisable browser. Will you provide an extension framework for Chrome?

A We plan to have an extension API in the future. We will get started on it just as soon as we can — I can't give you a timeframe on it. But, for example, the way we would bring the Google Toolbar to Chrome is that we would create an extension API and make it available to everyone, then build our toolbar on that. Other people could build their own toolbars too. (However many of the features from toolbar are already integrated into Google Chrome.)

Q How long till we see Mac and Linux versions?

A Predicting software development timelines is something I've learned I'm not very good at over time. However, finishing the Mac and Linux versions is now the single highest priority across everything we are going to do. It's a bit difficult to predict the ETA on them, but we are now going to migrate a lot of people [who have been working on the Chrome project overall] to work on the Mac and Linux versions even more, and that will accelerate the timeline. It will be months, though, to set expectations correctly.

Q How much faster is Chrome than other browsers?

A I don't think we have said Chrome is faster than other browsers — we have shown demonstrations of V8, which is faster than the JavaScript in other browsers. The thing is web developers currently program for the browsers that are out there, so they stay pretty light on JavaScript. They're not actually making the kind of applications that V8 can run at high speed.

Also, web browser speed is not just about how fast a particular page loads — it's many different factors. But the most common reaction we see when people use Chrome is: wow, that's fast.

Q What's different about security in Chrome compared to other browsers?

A Given each tab is its own process, each web page is sandboxed. We restrict privileges sharply in terms of what that process can do in terms of read and write for the rest of the system. We've built a layered security model, so if the first thing fails, you fall back to the second thing, then the third and so on. For example, first, we try to stop you going to a bad site through anti-phishing and anti-malware blocklists. If the user bypasses that warning, we contain the site to a single tab. If you close the tab, the content goes away, and it cannot read or write to the system at any time. Effectively, we sharply restrict what malicious programs can do.

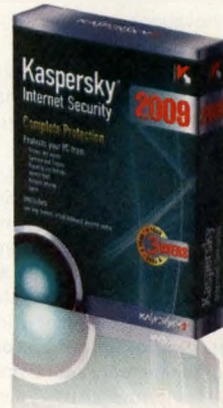
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ADOBE CREATIVE SUITE 4: BEST EVER!

Adobe Creative Suite 4 is the best graphics suite ever released.

John Brandon and Christopher Zammit check it out.

The full Adobe Creative Suite 4 product should be launched before the end of the year. We tested a feature-complete beta to find out if the new version will be a milestone or a millstone around Adobe's neck.

PHOTOSHOP CS4

It's no secret that despite the 21 other apps in the Adobe Master Collection, Photoshop is the flagship product in the new CS4 line. The new photo-editing tool has four main innovations, making it an impressive upgrade.

The first innovation is it now runs in 64-bit mode. Keep in mind that you need to have the 64-bit version of Windows Vista or Windows XP, as well as a 64-bit processor, and it won't hurt to have at least 8GB of RAM too. 32-bit apps can only access 4GB of RAM, but some workstation computers can support up to 32GB. According to John Nack, an Adobe Product Manager who blogs at <http://blogs.adobe.com/jnack>, 64-bit memory addressing improves performance by about eight to 12 per cent for most operations. However, when dealing with extremely large images (say, a four-gigapixel image), he says that

performance can be as high as 10 times that of a 32-bit app.

The second innovation is new Pixel Bender support (formerly known as Hydra), an Adobe technology that allows Photoshop to access your high-end graphics card directly. Photoshop can swap memory in RAM and use the graphics card for graphics rendering, giving a one-two punch that speeds up every filter and editing function.

We'll save the detailed benchmarks for a proper review, but suffice it to say that Photoshop CS4 is much snappier than Photoshop CS3. We tested CS4 on an HP Pavilion DV7 high-end notebook with a 2.8GHz dual-core processor, 4GB of RAM, Windows Vista Ultimate 64-bit and two 300GB drives.

We used a 10,000 x 15,000 image that was 430 MB in size. A complex fresco filter that takes several minutes on CS3 took only 20 seconds in Photoshop CS4. Most filters — including a basic blur and unsharp mask — were instantaneous. Liquify filters, new layers, artistic brush treatments and image resizing took only a few seconds.

The third innovation is a brand new interface that's a departure

from even the previous release. It doesn't follow the typical Windows Vista or XP conventions and hints at a day when Adobe will move their powerhouse apps to the web.

Finally, Photoshop CS4 has several new editing features. You can now rotate the canvas without rotating the image, select parts of an image in the Refine Edge dialog box, use new multi-channel and abstract colour channels and implement tweaks to the dodge and burn tools that improve the effect on colour-saturated images.

OTHER BIG APPLICATIONS

With all the fanfare over Photoshop and how it can now access a girth of RAM on 64-bit machines, the other apps in the Master Collection suite play a 'me too' role. However, they also run in 64-bit mode, use Pixel Bender to access your GPU and feature a new streamlined interface.

Dreamweaver CS4 now provides a powerful Live View feature. This is absolutely amazing for coders who work in JavaScript and other languages because it approximates browser compatibility. In our tests, Live View worked flawlessly when emulating Internet Explorer and only had

marginal positioning errors when used to emulate Firefox.

New Photoshop Smart Objects save a tremendous amount of time in workflow production. You can drag-and-drop them directly into Dreamweaver, encouraging dual-monitor use like never before.

Dreamweaver also adds Adobe AIR support for creating rich web apps. Think of it as the PDF for the web: applications can be fully developed for use in a browser in the same way that a rich document can be formatted as a PDF, without concern over program compatibility.

Adobe Illustrator CS4 finally adds multi-artboard support, which means that it has inched a bit closer to being a page layout tool. You can now view multiple pages of a document in all shapes and sizes. Illustrator also adds a new blob brush for creating artistic-looking objects. Its performance on a 64-bit computer with 4GB of RAM was phenomenal.

Long-time Illustrator fans will know that there is sometimes a pause or stutter when rotating, resizing or even just moving very complex objects around the screen. Even when using a sample Japanese menu with hundreds of lines of

WHAT WE LOVED MOST

1. LIVE PREFLIGHT — INDESIGN

InDesign now alerts users to incorrect images sizes, resolutions and even tells you when you have overspilled text on a page and where to find it.

2. CONTENT-AWARE SCALING — PHOTOSHOP

Recompose a photo as you resize it without distorting the image. This preserves vital areas (such as people) as the image adapts to new dimensions.

3. WEB DESIGN IN INDESIGN

Design your interactive material using InDesign and then export it directly to Flash in SWF format.

4. AMAZINGLY SIMPLE ANIMATIONS — FLASH

With the new Bones tool, it's now possible to animate a simple illustration in real time as well as create more naturally animated interactions between linked objects.

5. FIND CODE IN DREAMWEAVER LIVE VIEW

The new code navigator makes finding relevant lines of code a simple one-step process. No more tedious searches.

6. VIDEO POST PRODUCTION

Move content among After Effects, Adobe Premiere Pro, Soundbooth and Encore with unparalleled efficiency. Expanded Dynamic Link enables you to link content between components so you can see updates instantly without rendering.

7. TRANSCRIBE AUDIO IN VIDEO

You can now make video visible online to Google searches. Spoken words in audio are transcribed and turned into searchable metadata.

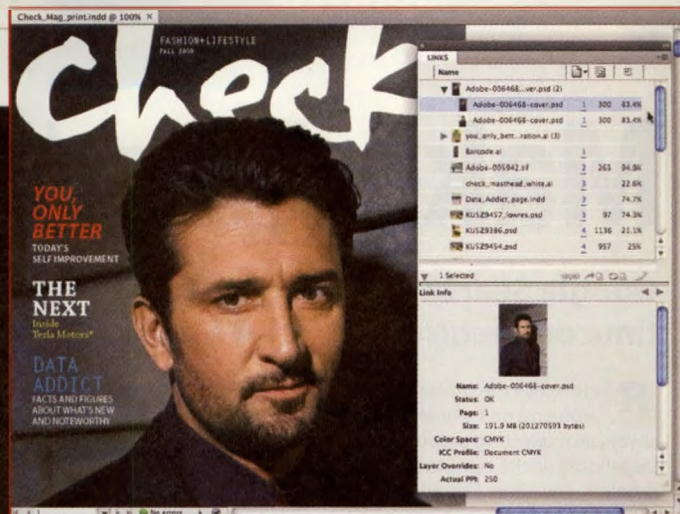
text and graphics, adjustments in Illustrator CS4 were instantaneous.

Flash CS4 — a tool for creating web animations — benefits the most from the new Adobe CS4 interface shift. There is now far less clutter found on the screen, and you can step animations by adjusting objects incrementally rather than using keyframe animation (where you make adjustments to each frame). Flash also supports more 3D animation-editing tools, inverse kinematics and Adobe AIR support.

After Effects, Fireworks, Contribute and **Soundbooth** have all been updated with a new user interface design and features that

unify CS4, making each application more powerful. Overall, CS4 is a major milestone because it's the first legitimate, powerful graphics suite to run in 64-bit mode. It points to a future where memory addressing, graphics utilisation, fluid design and technically superior features will rule the desktop.

As a final caveat: we should remember that the power of the desktop may yet be overshadowed by the extreme flexibility of web apps. And when that happens, we'll get to start all over again on the continuum towards cloud computing and online data warehousing. **QUT**



ADOBE INDESIGN CS4

The flagship page layout program for professional designers, InDesign CS4 also benefits from a facelift: it's now much easier to navigate around the screen. Palettes are more streamlined (they even ghost out when you move them around) so that options are just one or two clicks away. For example, on the new Preflight dialog box, you can quickly scan through any colour or font treatment issues. Preferences for the dialog box are not buried in a general window but can be found right on the dialog box itself. There's also a new conditional text option that works remarkably similarly to the layers in Photoshop: you can create one document for web and print and then hide or show individual elements with just a radio click. Smart guides that help you line up objects, task-based workspace views, an amazing 'rotate spread' option and SWF support, including export to Flash, are all key enhancements. Performance in InDesign seemed about 20 per cent faster than the CS3 applications during complex chores such as re-paginating a long document.

ADOBE PREMIERE PRO CS4

Premiere Pro is the only application in the Master Collection suite for CS4 that was not upgraded with the new interface. New support for hard disk-based (what Adobe calls 'tapeless') video cameras is supposed to be a key feature, but we could not get Premiere Pro to work with a JVC Everio GZ-HD6U camcorder, either in terms of recognising the device as a capture medium or reading the files directly from the hard disk drive on the camera.

Adobe is likely working out the bugs on camera support, but we did expect the leading feature to work out-of-the box. New encoding options for portable devices and a separate batch-encoding program called the Adobe Media Encoder are nods to the mobile and web markets who are constantly shooting video and want to take it on the road or upload to YouTube. These tweaks reveal that Premiere is trying to appeal to the budding videographer.

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Make friends with TechNet

Google Search is the lifeline for many Windows IT pros. But have you spent time on TechNet recently? Maybe you should...

Researching technical problems on the internet is always an interesting proposition. Depending on the complexity of the problem, you either find an answer within a couple of minutes or, if it's a particularly curly one, you'll still be looking after a couple of days.

For IT pros working in a complex environment, the nature of the problems you're likely to face are definitely of the latter variety, with the added sting that if you get it wrong you run the risk of affecting dozens of users, not just yourself. So, the need to be able to track down accurate information quickly is a must in our profession.

While Google Search is a massively beneficial tool for any IT pro, for Windows-specific research and troubleshooting, you could do worse than starting off at Microsoft TechNet (<http://technet.microsoft.com>).

Microsoft has thrown a huge amount of resources into keeping TechNet up to the minute, with loads of information and updates from Microsoft product evangelists and IT pro specialists. There are webcasts, a massive online documentation library, trial downloads, best practices, how-to's and updated product news.

There's also a huge amount of



TN: there's nothing more reassuring than the experience of those in the know.

content made available through the TechNet blogs (<http://technet.microsoft.com/blogs>), and I urge any Windows administrator or enthusiast to spend some time browsing and subscribing to the blogs — they contain an absolute wealth of product-specific information which you're guaranteed to find valuable. Some of the more recent enterprise-level projects I've been involved in have been researched end-to-end with information available on TechNet as well as some fantastic step-by-step instructions and videos.

There's nothing more reassuring when you're embarking on a difficult new project than reading up on the experiences of other people who have already been there

before you and have documented all the pitfalls.

The other available resource is a subscription to TechNet Plus. Subscriptions are, perhaps, slightly controversial, as people do have a natural disinclination to hand over money to any vendor (let alone Microsoft) for something of little or no obvious perceived value.

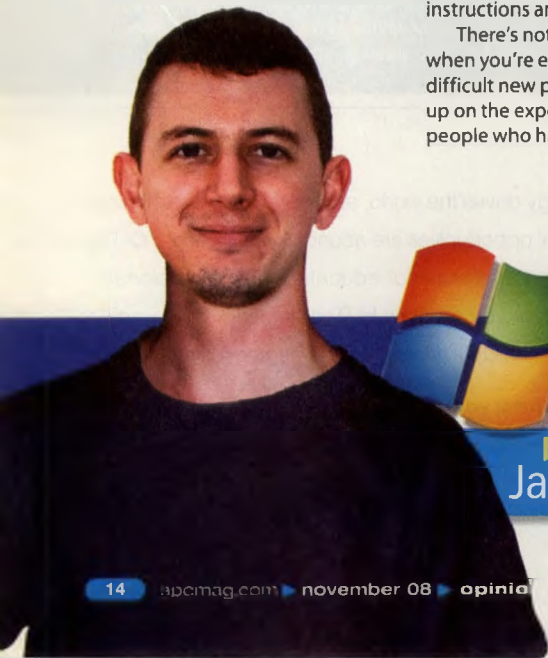
The value of a subscription is that it gives you access to some very useful resources — free online training which isn't available elsewhere (at least, not without paying) and a large library of downloadable, fully activated product content. The content alone is more than worth the cost of subscription, which has come down significantly from the old days.

You can pick up a single download plus DVD subscription for around \$800, but there are lots of opportunities to get ahold of cheaper, download-only subscriptions, volume subscriptions and discounts for academic institutions as well.

The online training is excellent — Microsoft has revamped their training modules so that some components are done using a remote terminal session to a server, so that you get some decent hands-on experience and visual cues rather than relying on pure text-based explanations — again, invaluable when you're embarking upon new projects.

Of course, there are many IT pros who have a very low opinion of vendor-based training, and certainly in the past many vendors were guilty of pushing their training and certifications streams so hard that quality and industry relevance were left behind. However, many vendors have picked up their game and now the available training is not simply an opportunity for accreditation but to genuinely get to grips with the product.

And yes, I know all this sounds like a sales pitch, but remember that it's not in any vendor's interests to make accessing relevant information about their products difficult, and they genuinely want their customers to have a good working knowledge about the technology. So get browsing! It's more than worth your while. **EDC**



WindowsView

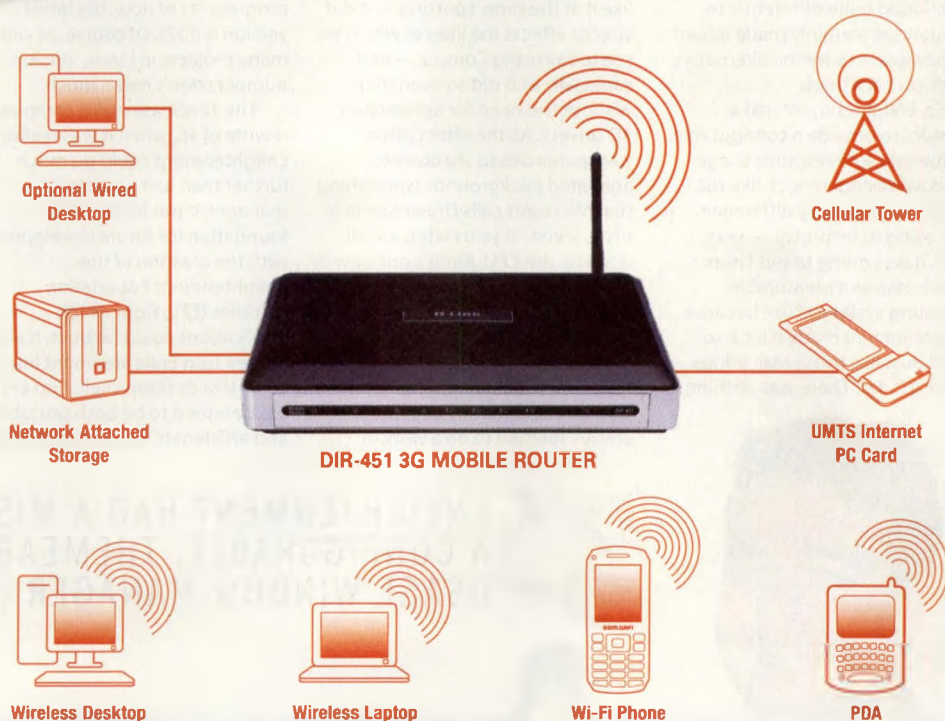
by
James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Windows for you every month.

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Return to enlightenment

First released in Australia in 1996 and since superseded by KDE and Gnome, Enlightenment has evolved into maturity — and it's still looking slick and snazzy.

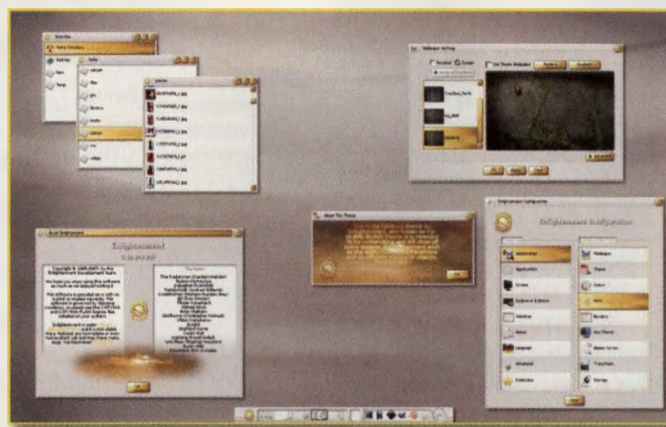
A long time ago, in a galaxy far, far... oh, OK, more like just over a decade ago, and here in Australia, Carsten Haitzler released Enlightenment. Not the state, or the place, but a window manager for Linux, unlike any other.

At the time of its release in 1996, KDE had just started and Gnome didn't even exist. Indeed Imlib, the image manipulation library for Enlightenment, later formed the base of Gnome's rendering engine up to Gnome 2.0.

At the time, Linux distributions relied heavily on window managers like TWM and FVWM for the interface — which, while they got the job done, weren't particularly pretty and sometimes functioned quite differently to Windows. It certainly made it hard for new users to try the alternative platform back then.

So, Enlightenment had a mission: to provide a configurable, themeable, low-resource usage window manager much like the others, with one key difference... it was going to be pretty — sexy even. It was going to put Linux on the map as a pleasurable operating system to use because Enlightenment made it look so good. Just like those Mac things.

And it did. There was nothing



Today Enlightenment is slick, fast, highly configurable and extremely pretty.

like it at the time, sporting as it did special effects the likes of which we see today using Compiz — and especially as it did so even then without the need for accelerated 3D drivers. All the effects, from transparencies to shadows to animated backgrounds (something that Microsoft calls DreamScene in Vista, some 10 years later) are all done by the CPU. But it's not slow or even demanding, because it was optimised from the ground up to do these tasks.

Today KDE and Gnome have long overtaken Enlightenment in popularity, probably because it always seemed to be a work in

progress (as of now, the latest version is 0.17). Of course, as with many projects in Linux, version numbers don't mean much.

The 17 release was a complete rewrite of 16, when it was realised Enlightenment could go much further than just a window manager. It put in place the foundation for future development with the creation of the Enlightenment Foundation Libraries (EFL) from which applications could be built. It also helped turn Enlightenment into a complete desktop shell. And EFLs are designed to be both portable and efficient in that they can even

be used on mobile platforms like PDAs and phones.

Today Enlightenment is still slick, fast, highly configurable and extremely pretty. It still does what other window managers currently can't, from animated backgrounds and menus to features like the desktop pull-down (where you can 'drag' one desktop over another like a piece of paper with your mouse).

And because it is extremely efficient, it's now finding a home on low-power machines like netbooks where it can provide an impressive 3D effect interface without the need for grunty 3D power on board.

It also integrates seamlessly with KDE and Gnome, which is precisely what a number of distributions do in order to take advantage of both Enlightenment and the extensive range of KDE and Gnome applications available. These include distributions like OpenGEU (opengeu.intilinux.com), Elive (www.elivecd.org), gOS (www.thinkgos.com) and OzOS (www.cafelinux.org/OzOs). Some of these are Ubuntu-based, like OpenGEU and OzOS, while gOS takes the easy desktop paradigm a step further to bundle Google Gadgets and Documents, as well as WINE for Windows programs. It's all rather slick, much like Enlightenment itself. [ETC](#)



ENLIGHTENMENT HAD A MISSION: TO PROVIDE A CONFIGURABLE, THEMEABLE, LOW-RESOURCE USAGE WINDOW MANAGER (AND SEXY TO BOOT)



LinuxWindow

by
Ashton Mills

Editor of the Linux Pocketbooks series, and now with CHOICE magazine, Ashton has been a tech journo for over 12 years, including five years with APC.

What does the shift key do?

Computers might have become easier to use, but there are worrying signs end users (and IT staff) are getting dumber.

Readers Daniel Ergas, of Kingston in the ACT, was helping one of his friends set up his PC. "A few days later I got a frantic email from him saying that his 'clue' button was not working," he writes. Ergas was stumped by the reference to the 'clue' button and asked his friend what he meant. "He then sent me a picture of the question mark key on the keyboard and explained that it did not work, since every time he pressed it, he got a dash. 'I replied, 'have you tried pushing the shift button and the question mark button at the same time?'. He tried it and sent me an email saying that this had fixed the 'problem'."

HOW CAN I TELL?

Andrew Marshall, from East Melbourne, has been in IT support since the mid '80s and confirms our suspicions about an epidemic of end-user stupidity. When an end user was having trouble connecting to a network, Marshall asked him whether he was using a wired or wireless connection. The reply was: "How do I tell?". Another user was

asked whether he had a laptop or a desktop. Again: "How do I tell?".

LABOUR-INTENSIVE EMAIL

When the manager at reader Cameron Ford's workplace was away for a month, his email was redirected to an assistant whom we'll call "Emily". Ford, from Traralgon, Victoria, recalls that when the manager got back he asked Emily to send the emails on to him. "Emily printed off every email (well over 100 pages), scanned them all into the computer, then attached the files in new emails to the manager," recalls Ford. When the manager got a total of 58MB's worth of emails with attachments, he asked her to look at his screen and pointed to the forward button.

EMAIL PASSWORD RESET

Sadly, it's not just end users that get confused — it's tech staff as well. Christopher Wilson, a tech support officer in South Headland, Western Australia, got an email from the IT administrators of WA's Department of Education and Training. It informed him that he would not be able to log into his mail account. Wilson says: "I thought this surpasses the end user who tried to send an all-staff email informing everyone that the email is down. These people are administrating

thousands of PCs and servers, so surely they should know that I would need to log onto my email account in order to read their email telling me why I can't log on to my mail account."

TONIGHT'S THE NIGHT

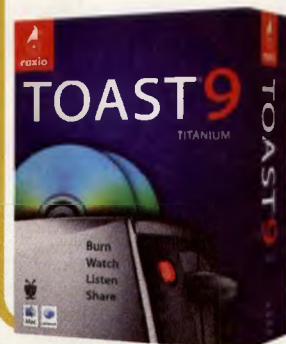
Peter Gallanty was taking inbound sales calls in a BigPond call centre when a customer requested an internet connection. Gallanty says: "The customer was happy with the ADSL options until I said it would take seven to 10 working days before he would be able to connect to the internet. At this point, the customer got agitated, saying in broken English 'No, no, very important, must connect internet tonight'.

Gallanty advised the would-be surfer that dialup was the only way to get online quickly, but it would be excruciatingly slow compared to broadband. "The customer didn't care. He kept stressing how important it was for him to have an internet connection that very night.

"So, I signed him up and walked him through the dialup configuration for his computer. When done, I advised the customer he was ready to connect to the internet. There was a tirade of heartfelt thanks, followed by a sigh and a short silence. 'Good, can look girlie pictures tonight. Bye.'" 

WINNERS!

The launch of Roxio Toast 9 Titanium redefines Mac burning. Toast 9 allows consumers to record high-def content from high-def camcorders and Blu-ray discs, as well as their favourite HD programming from Elgato's EyeTV devices. Users also have the option to burn HD video and slide shows on standard DVDs. For on-the-go entertainment, Toast 9 introduces Roxio Streamer, which allows users to stream video content stored on their Mac to a Wi-Fi connected iPhone or iPod Touch or any internet connected Mac or PC. Toast 9 also offers the ability to capture streaming audio for recording internet radio, and allows captured music tracks to be automatically tagged with song titles, artist or other related information. RRP \$179.95 inc GST. Also up for grabs are two copies of Roxio Easy Media Creator 10, Roxio's Vista-ready flagship suite of digital media applications worth \$159.95.



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EndUser

from
The readers of APC

APC readers who deal with new computer users or incompetent IT administrators share their survival stories.

Media centre, or not?

Q: When is a media centre not a media centre? A: When it can't handle that most fundamental of HTPC functions: DVD playback. Watchdog investigates.

I am currently pursuing my complaint through Consumer Protection but thought you might be interested in my HP Media Center experience, and, if all else fails, be able to help or offer suggestions.

I purchased an HP M9170A Media Center in March. On running it I discovered that DVD playback in Media Center stuttered; that is, the sound was perfect but the picture stalled and skipped frames. The problem only occurs when DVDs are run in Media Center (the DVD software is perfect when run separately), but — for those who are not familiar with Media Center — it is designed to run all your media from one user-friendly (and remote-control-operational) package without the need for a mouse, keyboard or multiple applications to open and tinker with.

I made calls to HP on a number of occasions, each time trying the same thing, including a re-format, which was ridiculous as the unit was straight out of the box, with no installs or third party software added. Finally, my case was referred to the hardware team, who were brilliant, but obviously, as all the hardware worked separately to the media centre, there was nothing they could do but re-format and send the unit back.

I then called HP again. They told me that the hardware was fine (no surprise there) and that it was fixed, a little

surprising as it was still stuttering.

I was then referred to an 'expert', who was helpful. On the phone, we discussed the problem in detail: CPU usage, RAM usage, video card settings, software that worked and registry changes I'd experimented with and their effects. He even called me. We left with him setting off to test the system with my settings. But then his promised callback date came and went, and guess what? Nothing.

The straw that broke the camel's back occurred today when I was

told by the HP helpdesk that it was a software issue, but not an HP software issue. Therefore they would not accept return of the item, there was no fix, and I should use a different software package outside of Media Center to watch DVDs. They said that as the unit was older than 14 days old it was no longer covered by their return policy, even though the first calls were logged less than four days after I registered the product.

HP head office cannot be contacted directly, at least by consumers. The helpdesk will not escalate calls directly, they will only 'refer calls', and they make you call back to 'see' if there is a response.

It's day 47. I'm tired.

Scott Walker
Perth, WA

We referred Scott's complaints to HP to find out what the go was with his less-than-functional media centre and received the following response:

Dear Watchdog,

Thank you for the opportunity to respond to the email from Scott Walker.

HP was concerned to hear of the less than satisfactory experience Mr Walker discovered when attempting to play back DVDs in his HP Media Center. We have been working with Mr Walker directly to resolve the matter to his satisfaction.

The HP Media Center the customer owns is in working order, however, it is not designed to play back in the highest resolution setting through the external device he is attempting. A lower

resolution, or disabling Aero, or upgrading the RAM and graphics card could improve the experience.

HP recommends customers who require HD output to consider HP systems with HD DVD and/or Blu-ray drives.

Brad Swiney
Public Relations Manager
Personal Systems Group
HP Australia

We referred Scott to HP's response, but he'd already devised his own unique way of having the last laugh:

"Oddly, the HP Media Center had an HD drive and also boasted 1080p, of which I was using 1080i. I was also the one who discovered the memory was insufficient, which HP refused to admit to or rectify.

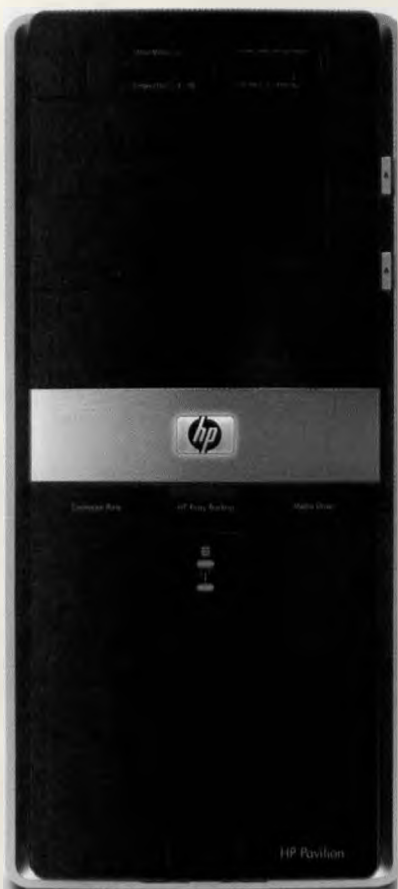
"I was eventually told that it was a Microsoft problem, not an HP problem, and that to resolve it I would have to go to Microsoft. Microsoft told me the HD playback software was HP's and the circle continued.

"On day 47 I got Consumer Affairs involved, as HP insisted the machine worked. They even told me that I was 'expecting too much'. I was also told to use Media Player until Microsoft fixed the problem.

"After some massive arguments, the Good Guys in Joondalup got involved and returned the product, taking up the fight themselves. They were told not to by HP but did it to keep a customer happy. I commend them for their assistance.

"I have since built a media centre from scratch. And, as a lovely act of revenge, rewritten a machine spec (I'm a project manager) to exclude HP PCs. This affects around 23 machines with between two and five PCs per machine. So, in short, I feel validated, and would never use an HP product again."

DVD playback isn't normally an issue these days for Windows users, but reader Scott Walker's experience with his HP Media Center told a different story...





CREATIVE LICENCE (TO NOT WORK)

APC reader Gurpreet Singh Khaira of Newcastle, NSW, wrote in to Watchdog to "relate my ongoing saga and installation problems with Adobe Creative Suite 3 Production Premium for Windows Student Edition." Gurpreet bought CS3 for his son, who was learning photo- and video-editing at his school, but after installing it (on 64-bit and 32-bit systems), none of the apps would open. Gurpreet was variously advised by Adobe to install updates, reinstall, run clean scripts, reboot etc., but nothing worked, so he eventually resorted to a complete professional formatting of the PC and Vista 32-bit reinstall from scratch. But CS3 still wouldn't work.

"I am a doctor by profession, and over the last four weeks I have wasted a minimum of two hours every working day without any success. The Adobe engineers don't appear to give a stuff and they have not even bothered once to call or come up with a solution. Adobe has sold me a dud product which does not work, and they bear no responsibility."

Mark Cokes, Adobe's Pacific Marketing Manager, told APC: "As correctly pointed out by the customer, while Adobe Creative Suite 3 is natively 32-bit, it will run on 64-bit versions of Windows Vista, and we continue to work with him and his reseller in attempting to bring this situation to a satisfactory conclusion."

Adobe eventually sent Gurpreet a new copy of CS3, which, after 10 trying weeks, saw Gurpreet finally launch his software successfully: "The problem was their software's incompatibility with the security interface on Vista Ultimate. This [new package] that worked did not require an automatic activation key to work on one computer. Therefore, I am not sure that other users would be able to use this software out of the box after buying. This is a flaw with their software and they should warn their potential users of this problem. It is shame for the engineers at Adobe who have such good software, the use of which is being hindered by licensing incompatibilities."

ARE YOU CALLING ME A LIAR?

My daughter and I both have mobile phones with 3 on my account. My daughter damaged her phone and was told she was eligible for a handset replacement. I returned with her to the store to authorise the handset replacement and was told that we weren't eligible for a replacement until the end of the month.

I returned to the store at the end of the month and was told that we still weren't eligible for a handset replacement and would have to wait for another two months.

I complained that we'd been told that we were eligible now. The salesperson said, "I'm not calling you a liar, but our records show that you weren't in the store on those dates."

This was said in front of a shop full of customers.

I was rendered speechless by this comment and left the store.

My daughter later said that she, too, was shocked by the comment.

I have tried without success to make an official complaint about this but, every time I call back to check on its progress, they just try to renew us on a new plan. But I certainly don't want to lock myself into another 24-month contract if this is the way I'm going to be treated by 3.

Robin Gibney
Dandenong South, Vic

3 adopted an apologetic tone to Robin when providing its official response to Watchdog:

Dear Watchdog,
In regards to Mr Gibney's recent in-store experience, 3 has formally written to him to apologise. 3 strives to ensure a high standard of service at all times, and we regret that this was not his experience in this instance.

We have alerted the store to Mr Gibney's complaint and apologise to Mr Gibney again for any distress caused.

Tanya Bowes
Director Communications &

Corporate Affairs 3 Mobile

We asked Robin what he thought of the response: "The letter itself seems to me to be written by rote. When talking to the customer they all seem to use the same catchphrases: '3 strives to ensure a high standard of service', 'Your call is important to us', 'We take all complaints seriously' etc. I received the letter of apology last night: the letter is from someone four times removed from the source of the problem, but at least it's an apology, so I feel that the issue is resolved with about 70% satisfaction."

"Then, reading the last line of the letter, regarding an 'upgrade offer' of my handset, I called customer care to see what they could offer: their best offer was for me to spend an additional \$20 per month and sign up for another two years. I doubt that I will sign up with 3 again."

"As I keep saying, I would have been happy with the apology, but 3 continues to make these crap offers in an attempt to distract from the main issue and sign me up for another term."



Love may mean never having to say you're sorry... but what does 3G mean?

watchdog@acpmagazines.com.au

Has an IT vendor or telco stuffed you around? Let us know about it and we'll chase them for a solution on your behalf. Letters sent to watchdog@acpmagazines.com.au must include the writer's full name, street address, suburb, state and phone number to be considered for print publication (please also include details such as invoice numbers and people you've spoken to). Address and phone details will not be published. All correspondence becomes the property of APC and is subject to editing.



iPhone mysteries

There's a lot about the Apple iPhone that puzzles APC's readers.



iPhone: the most overhyped release of the year, or not?

ASLEEP ON THE JOB

I've been a happy owner of the iPhone for two months now, and I must say I truly believe the product has lived up to its hype. However, when I compare the iPhone to smartphones released by its competitors, I can't help asking why those manufacturers never released a similar feature-rich phone prior to the iPhone's arrival. Much of the technology found in the iPhone has been cheaply available for many years, and it had been clearly obvious, prior to the iPhone's release, that the global consumer market wanted an intuitive computer/phone/music/camera hybrid.

After reading numerous reviews in your magazine, and through other media, I've now realised that the iPhone's success is more the result of Apple's competitors being complacent and misreading consumer demand. Their failure has been further exacerbated by their belief that more profits come from selling multiple products with diverse technologies, instead of merging them all into a single

unit like Apple has done.

Theodore Panagacos
Kew, Vic

IPHONE OVERRATED

After getting to see the iPhone, I have to question whether it's worth the price tag. Sure, it's very functional — but worth it? I think not. Everything it can do, other phones can do. But let's look at it from the perspective of how it meets a phone's basic needs: calls... yes, text... yes, MMS... no! Why would you bother making a 3G phone without something as basic as MMS? The real disappointment is that everyone seems to think that it is OK to leave this out. I will be one of the few to wait till Apple decides to make a decent iPhone. I got an iPod instead.

Matthew Burns
Margot, Qld

VISTA ADULATION

Adulation of new technical breakthroughs might be justified in aesthetic or technical terms, but in the real world of business, there must be serious questions about software that is too hard to use, that is bug-ridden or requires expensive additional resources to implement.

I fear that James Bannan's adulation of Vista (Windows View,

APC September, page 19) may have missed this point. In my business comprising five small shoe shops, we have tested Vista and run a mile back to XP. We are also grappling with a new version of QuickBooks, which is about the most bug-ridden piece of software ever installed on our computers. And, personally, I have abandoned MusicMatch Jukebox because its latest incarnation is retrograde junk.

Business needs critical appraisal of new software, not endless apologies for bugs and bloat. It may not make exciting reading, but there is a beautiful story in one piece of gorgeous software which has been used in my business and my life for at least a decade. It is Lotus Organizer — a truly elegant and felicitous diary, planner and contact manager — which is simple, easy to understand and, in my business, almost indispensable.

John Gilmour
Glen Huntly, Vic

IT'S THE NETWORK

With regards to Steve Schier's complaint about MYOB technical support (Watchdog, APC October, page 18), I find it interesting that he can blame the technical support staff of MYOB for being unhelpful, when clearly the issue was with

letter of the month

SSD IS THE FUTURE

Ten years ago we were stunned by the 47GB capacity of desktop hard drives. At the time it was an enormous figure, and it is just amazing how hard-drive capacities have reached the 1,000GB (1TB) mark since then. Consequently, the cheaper cost per GB means that sales of these mechanical hard drives are skyrocketing. These larger-capacity hard drives will no doubt become the norm in the near future, but should we really still be relying on and exhausting this ageing technology? The newer SSD (solid state drive) technology has been available for many years, yet computer systems containing

these types of drives are rare. There are numerous benefits of SSD drives, including their resistance to shocks due to the lack of moving parts. Since data loss these days is a significant issue, in many cases due to physical damage of the drive itself, imagine the reduction in the number of these cases if SSDs were used. There are, of course, some limitations to the SSD technology (such as expense and limited write cycles), but the benefits surely outweigh the disadvantages. SSDs have already been used in all models of ASUS's Eee PC and other similar netbooks. It's time that hard-drive manufacturers begin producing

SSDs on a mass scale for desktop PCs. It's definitely the way of the future.

Michael Dimitriadis
Templestowe, Vic

Michael wins this issue's Letter of the Month prize, a Logitech Cordless Wave Desktop keyboard and mouse set valued at \$179.95.



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It's not easy being green? Colin from Melbourne has a few things to say about APC's power-measuring...



the server administration.

This smells of leaving the network share "read only", which is the default for any Microsoft-based operating system written in the last seven years. To hold MYOB accountable for the way a server is set up is the equivalent of holding Toyota accountable for rising fuel prices.

It is all well and good to ask MYOB to improve their fault-finding checklist, but to what end? Should MYOB tech support be guiding IT staff through group policy objects in Active Directory? As soon as something goes wrong they would be sued for millions.

MYOB staff write software; IT people play with networks. It should end there. As an IT person myself, I have had my frustrations with the likes of MYOB and Quicken, but at the end of the day I know, clearly, where their job finishes and mine begins.

Jason Campbell
 Tura Beach, NSW

PC GAMING TOO EXPENSIVE

Paul Nickodem writes in the Epinions (APC October, page 21) section that Ubuntu is just too slow for him to run anything. He then says that he is a gamer. I'd suggest that if the only reason he is using a PC and Windows is

games, then he is overpaying for his gaming platform. A Nintendo Wii is less than \$400, an Xbox 360 less than \$350 and a PlayStation under \$700. If he bought any one of these he would have plenty of money left over to buy a multitude of games. Also, I suspect that Paul has only run Ubuntu from the live CD and that is why it is "too slow" for him.

In the same issue, Ferg Brand is curious as to why a 300-watt PSU only used 1,384 watt hours. I have a car with that can produce 200kW of power, but that doesn't mean it does that as soon as I turn on the key! The PSU is rated at 300W maximum — obviously the PC it was inside did not require anywhere near that.

Harry Phillips
 Morayfield, Qld

GREEN PC CONFUSION

I commend you on your effort to find Australia's greenest PC (APC October, page 8). However, I take issue with your published power-to-performance ratios. Firstly, the ratios should not be presented in the format x:y as this is, in fact, an odds ratio; and secondly, the figures you present are, in fact, performance-to-power ratios.

Taking the given power (Watts,

W) figures and dividing by the respective performance figures (a unit-less measure), the ratios for power-to-performance for the three leading PCs should be 0.313, 0.348 and 0.392 respectively. In this measure, the smaller the number, the better or greener the PC.

However, for most people this may seem counter-intuitive, which is why I suspect you chose to present figures that really represent a performance-to-power ratio. This compares favourably to other ratios that people are familiar with, for example, a car's power-to-weight ratio (usually expressed as kW/tonne) or the colloquial 'bang-for-bucks' ratio. The bigger the number, the better — or in this case, greener.

The performance-to-power ratios of performance divided by power consumption are 3.195, 2.872 and 2.549. These closely match your published figures. The odds ratio figures quoted in the article have a different meaning and are more akin to gambling. A ratio of 3:193 means that there are 196 (3+193) outcomes or chances and that there three chances in 196 in favour of the left-hand outcome compared to 193 chances in 196 of the right-hand outcome.

Colin Fee
 Monash University,
 Melbourne, Vic

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Come on, have your say! We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@acpmagazines.com.au. All correspondence becomes the property of APC and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Address and phone details will not be published.



This month in Labs... Get a move on

Over the past few weeks I've been doing a lot of travelling, and when you're far from your desk there's nothing more aggravating in the world of personal computing than the beep of a notebook on the verge of going to sleep, right when you need it most.

It happened to me a few times:

sitting in a meeting taking notes for a report on our web site; sitting on a plane with fingers crossed so I could watch the end of a cliffhanger movie; or hunting the skirting boards of a café trying to find a power outlet without looking like I was scoping the place for rats. It's frustrating and it can bring your immediate work (or play) to a dead stop.

The alternative, of course, is packing a spare, or finding a power point, but there are times (more often than not, for me at least), where it isn't practical or I don't think to pack the spare.

Two companies have just begun a new arms race for the attention of portable computer users. HP announced that its new EliteBook

6930p will work on battery for a full 24 hours, and Dell spoke of its new Latitude E6400, which can work for 19 hours straight. One part of me is pleased, as more-efficient notebooks and better battery life are things I'd love to see; the other is hugely skeptical of these claims.

I did manage to wrangle some more details from HP. The 24-hour EliteBook has a very specific build, they say, a low-power 80GB Intel Solid State Drive, the use of a 14in LED screen and a new "Ultra" capacity battery (and only running Windows XP). To add more confusion to the mix, the notebook is outfitted with custom drivers and BIOS to further reduce power consumption. However, when

asked if a consumer could walk in and buy one of these, HP was a little cagey. It seems some of the components aren't available yet and the drivers would only be available if the customer bought that exact specification. Great.

Dell's Latitude has an even heavier design. The 19-hour battery life means attaching the long-life 9-cell battery and a dock-like second battery, but the list of caveats is shorter. I wonder if it comes with free chiropractor vouchers?

In either case, a new cold war is beginning. It won't be fought with nuclear arms proliferation, or endless spy stoushes, but with Lithium-Ion batteries and low-power notebook parts. The possible winners? Us. **ETIC**



A NEW COLD WAR IS BEGINNING. IT WON'T BE FOUGHT WITH NUCLEAR ARMS BUT WITH LITHIUM-ION BATTERIES AND LOW-POWER NOTEBOOK PARTS

NICK RACE — TECHNICAL EDITOR

"I'VE BEEN EVERYWHERE MAN..."



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Dell's Studio Hybrid: designer PCs just hit the mainstream. ➤



Dell Studio Hybrid

A stylish appearance and low power consumption earn points, but price is a sticking point.

For a common-or-garden variety computer user, it's fair to say that PCs have been fast enough for a while now. Unless you're a hardcore gamer or you spend a great deal of your time encoding video, the chances are that when you're surfing the internet or writing a letter (or even waiting for the computer to boot up), if your PC is less than two years old it does so without boring you to death. These facets, coupled with the fact that most people buy laptops these days, means that PC companies are looking at new ways to sell desktop computers. And two of the big new shouting points are style and power consumption.

With Dell's Studio Hybrid, it's good to see Apple finally getting

• **CONTACT** Dell
• **ONLINE** www.dell.com.au
• **MARKET** Everyone
• **PRICE** \$2,135

✓ Looks good; small; quiet; power-efficient.

✗ Price; not upgradable; small drive.

6/10

some competition in the style department. Its tiny, tailor-made chassis is pill-shaped, giving it a furniture-like, organic feel instead of the usual boxy thing which takes up half your desk. It's available with a choice of translucent plastic 'skins' or, if you really want to make it look like it's come from IKEA, there's a bamboo option too. The components are laptop-based, which helps keep the power consumption and size down. This is aided further by the laptop-style external power supply: only one fan is required for cooling the CPU,

meaning the Hybrid emits only a soft whirring sound. The stand allows it to be mounted vertically or horizontally.

You can access the innards simply by removing two screws, but there's little point. Every millimetre of the inside is used up, and you won't be able to replace or upgrade anything without serious warranty-busting levels of prying apart. But this point should be moot: Dell's online configurator means you can tailor the specs and components as you desire, and its outstanding 30-day satisfaction guarantee and two-year onsite warranty means it should stay that way.

The range starts at \$999, but our review unit was near the top of the line with a 2.5GHz Core 2 T9300 processor, 4GB RAM and a 320GB 5400rpm laptop hard disk. This will take care of all 2D applications thrown at it, but the Intel X3100 graphics mean that only old games are playable.

Media Center credentials are boosted by the inclusion of an HDMI port (in addition to DVI) and optical S/PDIF. Onboard audio is based on Creative's Sound Blaster Audigy HD, and our unit came with

a Blu-ray-playing optical drive. Consequently, you can get some great pictures and sound pumping through your home theatre system. However, the 320GB hard disk will fill up quickly and, although you can buy HDTV tuners for USB, external storage really should use an eSATA connector, and there isn't one here.

On the front are two USB ports, headphone jack and a media card reader which takes all but CF cards. At the back is Gigabit Ethernet, mini FireWire, two audio jacks and three more USBs. Wi-Fi is integrated too.

It doesn't come with a monitor, but then you do have Dell's excellent range to pick from. It does come with wireless keyboard and mouse, although both feel a bit too 'plasticky' for our liking.

At \$2,135, though, it's rather expensive. Dropping the specs right down can save some cash: the bamboo sleeve costs \$167 and Blu-ray costs \$249. However, you're still looking at around \$1,500 for a modest-performing machine with no monitor. Acer's similarly small and low-powered Veriton and L-series Aspire can be had for less than half that amount. Although the spec isn't as high or as configurable and the support isn't as good, it's hard to recommend Dell over Acer.

Nick Ross



digital cameras

Casio Exilim EX-F1

Casio's new sensor promises much.

Generally, the aim of a digital camera is to capture what our eyes see. However, the latest offering from Casio isn't designed merely to live up to human abilities but to better them.

The EX-F1 is special because it's bringing high-speed photography to the consumer audience for the first time. The fastest, most expensive digital SLR currently on the market might eclipse the F1 on image quality, but it can't touch it in terms of image speed.

While Casio has been the first to market such a camera, its success is owed in no small part to Sony. The powerful 60fps CMOS sensor that makes the camera what it is came out of Sony's imaging labs with the moniker IMX017CQE. The heart of the CMOS tech is a 'Column Parallel' analogue-to-digital (A/D) conversion. An imaging sensor is made up of millions of photodiodes in uniform rows. Traditional CMOS sensors use correlated double sampling (CDS) circuits at the end of each vertical row to remove fixed pattern noise before passing the signal to a single on-chip A/D converter.

Sony's column parallel technique replaces these analogue CDS circuits with dedicated A/D converters for each vertical row, with CDS noise cancellation done digitally. Because these A/D converters operate in parallel rather than dealing with each row's information in series, capture speed can be increased significantly.

This system gives the EX-F1 three key features. The first — and most championed — is the ability to capture 60 frames per second at a resolution of six megapixels. This is the highest image quality available, though the

sensor can also handle a staggering 180 frames per second at 2.8 megapixels. The camera can also record high-definition 1080p video at the same speed and quality as a digital video camera. Finally, the EX-F1 can combine the two features: full-size still images can be recorded during high-definition filming.

The obvious strength of a high-frame-rate camera is its ability to capture slices of split-second action — a wine glass shattering, for example, or a water balloon bursting. When recorded at 60fps using Casio's technology, both of these examples look stunning. Every shard of glass is frozen in perfect clarity, as are the drops of water hanging motionless in mid-air before gravity takes hold. The EX-F1's 'pre-shot' mode gives users the ability to capture a moment with very little skill or timing required. When shooting at high frame rates, the camera takes a number of frames before the shutter has been completely depressed. As a result, if you're not quite quick enough to press the shutter at precisely the right moment, chances are the image you were hoping for will have been captured as part of the pre-roll.

The F1 is hardly bulky, but it's certainly as big and heavy as an entry-level SLR with kit lens. The whopping 12x optical zoom lens adds to the weight, though it's well integrated into the body. And while a 12x optical zoom is handy, it does cause image stabilisation problems.

The EX-F1 not a perfect still camera or a perfect video camera — but it straddles the middle ground perfectly well.

James De Vile & Geoff Harris

CONTACT Exilim
ONLINE www.exilim.casio.com
MARKET Everyone
PRICE \$1,199

✓ Amazing frame rate; great visuals.

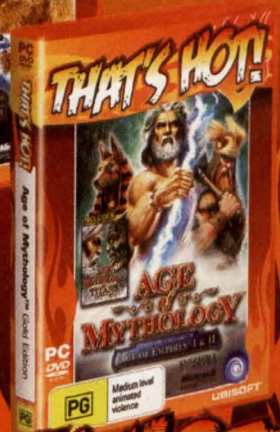
✗ Bulky.

8/10

Capture fast-moving subjects easily using high frame rates with the Casio Exilim Pro EX-F1.



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Dell's Inspiron Mini 9

Dell's new \$599 mini notebook has maximum appeal.



Dell's entry into the netbook market has been perhaps the most anticipated since ASUS first defined the category barely one short year ago with the original 7in Eee PC. Now the Inspiron Mini 9 has arrived, and it's set to shake up the netbook scene.

It's no surprise that Dell settled on Intel's N270 1.6GHz Atom processor as the Mini 9's powerplant — the N270 is the engine of choice for most netbooks. It's paired with 1GB of RAM, fitted as a single stick into an easily accessible DIMM slot. That combo of processor and RAM puts a surprising amount of pep into Windows XP and the most common day-to-day productivity and multimedia applications.

Instead of a hard disk, Dell chose a solid state drive — specifically the UM-SSD (Ultra Mobile Solid State Drive), supplied by OEM company STEC and built

• **CONTACT** Dell
• **ONLINE** www.dell.com.au
• **MARKET** Everyone
• **PRICE** \$599

✓ Zippy CPU; comfy keyboard; screen.

✗ No built-in 3G; no Linux option yet.

8
10

into a PCI Express Mini Card format with a SATA interface and inbuilt controller. STEC claims the UM-SSD reads up to 85MB/s and writes at up to 25MB/s.

The Australian edition sports a 16GB drive, one of several differences you'll note between the local and overseas versions. Considering ours has Bluetooth, the higher-spec webcam and a 16GB SSD, on the face of it we've landed Dell's top-shelf spec. However, Linux failed to make the cut. While customers in other countries can order a Mini 9 preloaded with Ubuntu 8, the local launch is limited to Windows XP Home SP3.

Stuart Buxton, Inspiron brand manager for Dell ANZ, says that while Linux was on the company's

radar, "We're not seeing customer demand (in Australia) for Linux at this time... although we'll continue to monitor consumer sentiment." Closer to the horizon is a drop-in 3G mobile broadband modem, although there's no set timeframe or price.

Dell has married the Mini 9's solid state drive to a standard four-cell battery rather than a three-cell unit. It's a rule of thumb that you should expect as much as one hour per cell, and during our tests the Mini 9 was almost bang on target.

We switched on the 11g Wi-Fi, set the screen brightness to 66%, wound the volume to full and sat back to enjoy a handful of DivX videos. It took slightly more than three hours before the battery went belly up.

Shortcuts for the function keys, absent in the prototype stages, have returned as a row of Fn+ modifiers along the middle row of the keyboard. The top row of keys use Fn+ modifiers for a predictable range of hardware controls, such as dropping the Mini 9 into standby mode, switching the screen over to an external monitor, and whatever the hell Print Screen is used for these days.

However, while the relevant Fn+ taps summon up on-screen utilities for wireless (to enable or disable Bluetooth and Wi-Fi) and battery level, the volume and screen brightness keys are unaccompanied by any such visual prompts. The keyboard

itself is a melange of styles. The alphanumeric keys are close to full size, with the primary Shift, Ctrl and Fn keys also amply sized, yet the navigation and symbol keys (along with Tabs, Caps Lock and Right Shift) are much slimmer.

It's quite comfortable to use, with a crisp movement and well-defined travel, although it's a little on the noisy side. Dell has also adopted a sealed keyboard design to help the Mini 9 withstand liquid spills and avoid trapping breadcrumbs.

The screen is bright and sharp, with LED backlighting and driven to a maximum resolution of 1024 x 600; beneath it sits a pair of punchy speakers.

Selection of ports is fairly standard. A power socket, two USB 2.0 jacks and a memory card reader (suitable for SD and Memory Stick wafers) are ranged along the left side with a third USB port, 10/100 Ethernet, VGA out and audio in/out along the right side. Two small LEDs on the leading edge indicate power and battery status, while a tiny pin microphone is concealed under the chassis' curvature in front of the trackpad.

Flip the Mini 9 onto its back and a single panel provides fast access to a bay containing the solid state drive, memory slot, card and an empty bay marked 'WWAN' for the optional 3G mini-card.

While Dell hasn't infected the Mini 9 with lots of unwanted bloatware, there are a few additions sitting atop the preloaded Windows XP Home OS. These include Google Desktop 4.0 and the Google Toolbar for Internet Explorer, a 90-day trial edition of McAfee Security 2008, and Dell's own webcam videochat software. More appealing is a free one-year account with online storage provider Box.net.

David Flynn



At long last, Dell enters the netbook fray with the Inspiron Mini 9.

Much Cooler! Less Noise!!!



RADEON HD4870 Sonic Dual Edition

- ★ 512MB 256bit DDR5
- ★ Turbo Memory / Core Speed: 4000 / 775 MHz
- ★ Sonic Memory / Core Speed: 3800 / 750 MHz
- ★ Dual Bios provides dual overclocking settings
- ★ Dual fan provides more airflow allows higher performance with super low noise
- ★ "Smart Switch" controls the dual bios providing two overclocking speed



RADEON HD4850 Sonic

- ★ 512MB 256bit DDR3
- ★ Memory / Core Speed: 2000 / 685 MHz
- ★ Two ball bearing fan allows the fan to move smoother, lengthen the life circle of the fan
- ★ Heat pipe fan sink provides more effective cooling solution
- ★ 8 pin power connector supports up to 150W power circuit
- ★ 3-phase power supply provides stable power circuit



Distributor



Palit HD 4850 Sonic

Palit expands the Sonic line-up of overclocked graphics cards.

Straight from the word go the HD 4850 impressed us. Its competitive launch price and performance meant it looked like it was going to take the crown as the best-value graphics card on the market. Like every product, however, nothing is perfect. The single slot cooler didn't do wonders for core temperatures, making it one of the hottest cards we've seen in a long time.

Palit was one of the first companies to do something about it, and they also took the time to overclock the card to give us more bang for our buck. Moving from a stock 625MHz to 685MHz we should see a nice bump in performance, while the memory has been evened out from 993MHz to 1000MHz, giving us a nice round 2000MHz DDR memory clock.

What all these tweaks equate to is a card that runs faster and cooler than a reference-based one, while costing only slightly more.

CONTACT Palit
ONLINE www.palit.biz/en/
MARKET Everyone
PRICE \$249

✓ Performance; price; temperatures.
✗ Dual slot; memory barely overclocked.

7/10

While the overclock is handy as always, it doesn't really make too much difference to our gaming experience. However, it does help to keep our minimum frame rate above that much-needed 30fps barrier.

The biggest benefit about the card is the aftermarket cooling option. While our reference cooler puts the back of the card at a very warm 65°C, the aftermarket cooler from Palit helps keeps temps at a much more reasonable 50.3°C.

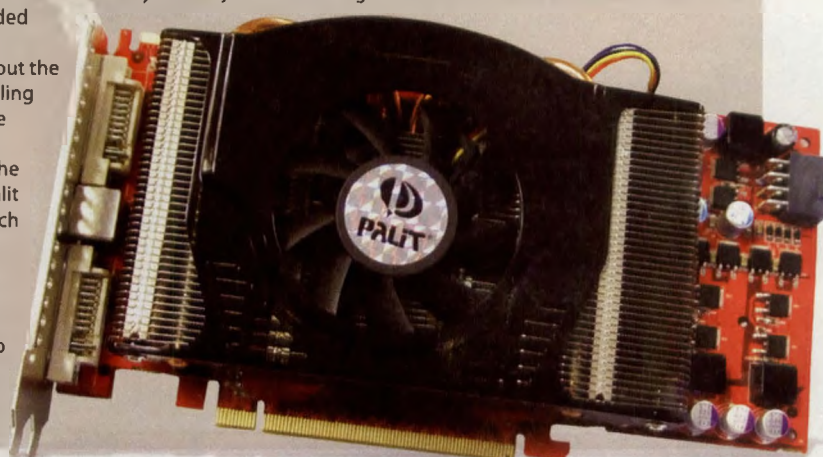
Just as with anything, the cooler running card comes at a cost — moving from a single-slot design to a dual-slot one. This isn't too much of an issue though, as most

motherboards are designed so that if you do use a dual-slot card you still have as many handy expansion ports possible.

If you find yourself looking for

an HD 4850 but don't want to deal with the worrying temperatures that the reference card offers, the Palit HD 4850 Sonic is an excellent choice. However, it would have been nice to see Palit increase the memory clock to 2,100/2,200MHz, as we've seen from some other companies already.

Shane Baxtor



ASUS 9800GTX+ TOP

The new 9800GTX+ TOP from ASUS sports some pretty nice clocks.

With the move to the new GTX200 naming scheme, we thought we'd seen the end of high-end 9000 series products, but we were wrong. Nvidia has recently decided to update the 9800GTX with the 9800GTX+.

As far as specifications go, the differences are minimal. Stream processors on both cards are 128 and

both offer 512MB of GDDR3 memory on a 256-bit interface, clocked at 2,200MHz. What is different is the core, which has been bumped from 675MHz to 738MHz, along with the shader clock moving from 1,675MHz to 1,836MHz. In essence, the new + variant is

nothing more than an overclocked 9800GTX. Considering we've also seen companies like ASUS, BFG and XFX offer cores in excess of 700MHz, the clocks aren't exactly a huge bump.

It's clear ASUS knew this, though, so they decided to bring the card under their TOP naming scheme and really ramp up the clocks. The core now comes in at 775MHz, the shader clock at 1,950MHz and the 512MB of GDDR3 memory goes all the way up to 2,360MHz DDR.

The only other change is the cooler, which is a bit curvier to help more cool air pass over the card when running an SLI or Tri-SLI

setup. All the same connections are present, with two six-pin PCI Express power connectors at one end of the card and two SLI connectors at the other. We also have the standard TV-Out port and two Dual-Link DVI connectors. Being a higher-end card, there is, of course, a dual-slot cooler used.

Performance compared to the stock 9800GTX is way up, with some good gains being seen across the board. Synthetic tests, including 3DMark06 and Vantage, are way up, while games such as UT3, World in Conflict and Crysis also see good gains. Having said that, however, we wouldn't upgrade from a 9800GTX to a 9800GTX+. If you're looking at upgrading to something better, your money would be better spent on one of the new GTX200 series cards.

Shane Baxtor

CONTACT ASUS
ONLINE www.asus.com
MARKET Everyone
PRICE \$349

✓ Overall performance; great overclock.
✗ Pointless model; limited bundle.

7/10



Lian Li Armorsuit P80

The 600 x 600mm monster.

Coated in black, hairline-brushed aluminium paint, the Lian Li Armorsuit P80 stands at 633mm high and 610mm deep, which puts it into the Super Full Tower category.

At first glance, there's not a lot that stands out — no 200mm+ fan installed in the left side panel that glows in four colours, no massive window that lets you see inside the case. The rear looks pretty normal, though it is, of course, bigger.

The top of the case features the power and reset button and below that we have the Lian Li logo, which sits attached to a door that opens to expose four USB 2.0 ports, microphone-in, line-out and FireWire, along with a single eSATA port.

It isn't until everything is

installed and you turn your computer on that you notice the blue glow emitting from the front of the case, from three 140mm blue LED fans installed behind the front door. If that isn't enough air-flow, the top of the case sports another 140mm fan, while the rear has a slightly smaller one.

Behind the door, which can be adjusted to open to the left or right, there's room for a massive 12 x 5.25in bays. Two separate racks that slot into the bays give you the ability to install up to six hard drives at the cost of six of the bays. If you want more hard drives, you could have a total of 11 alongside a single ROM drive. Buying extra racks gives you the ability to mix and match the hard drive/ROM drive configuration to suit your needs.

Hardware installation is easy, with a removable motherboard tray and plenty of room. The overall size of the chassis gives your components plenty of room in which to breathe.

On turning the Armorsuit P80 on for the first time and seeing the blue LED fans fire up, you get a sense that you're looking at the Rolls Royce of cases. If you love this case but find it too big or too expensive, take a look at its smaller variant, the P60, which carries 120mm fans and has less room but features the same quality and overall design.

Shane Baxtor



• CONTACT Lian Li
• ONLINE www.lian-li.com
• MARKET Everyone
• PRICE \$595

✓ Big; easy to work with; excellent cooling.

✗ Expensive; black only; no power supply.

8
10

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iCute 850-watt PSU

The 850 Watt iCute packs quite the warranty.

If you're looking at \$1,500 processors and \$2,000 graphics card setups, an extra \$400 for a top-of-the-line power supply doesn't seem like a lot. If you're looking for a whole system for around the \$1,500 mark, you could probably get away with a good-quality 620-watt to 750-watt power supply.

On the other hand, if you think that in 12 months time you'd like to introduce a second graphics card or a more powerful one, climbing up to an 850-watt unit is probably a good idea.

iCute has a large range of power supplies, at the top of which is the iCute 850-watt AP850AS. It is part of the 80 PLUS range, which means that an absolute minimum of 80% efficiency is offered.

On pulling the unit out of the box, you first notice the quality of the mirror finish, plus the fact that

CONTACT	iCute
ONLINE	www.icute.com.tw/english
MARKET	Everyone
PRICE	\$229

there are no cables hanging off it — like many higher-end power supply units, it uses modular connectivity. Another standout feature is the 140mm fan that sits on top. Thanks to the LEDs embedded into it, when powered on it emits a blue light.

Naturally, connectivity is one of the most important features. Included are our main motherboard connectors, a 24-pin connector with a 20 + 4 split, alongside a six-pin and eight-pin motherboard connector. Also included are 10 x four-pin molex connectors and four SATA connectors.

The power supply didn't fumble once under constant loops of 3D testing. But while it handled the HD 4870 X2 configuration with no

- ✓ Completely modular; great looks; 14cm fan.
- ✗ Still overkill; only four SATA connectors.

8
10

issues, this is the minimum amount of power you want and doesn't give you much of an upgrade path for more power-hungry devices in the future.

What this unit is good for is a single dual-GPU graphics card or two single-GPU graphics cards, along with a couple of hard drives, a decent overclock on your CPU and the standard line-up of fans and other accessories, while also giving

you room for improvement. Throw in the flashy looks, the big fan that keeps your system cool and a lifetime warranty, and you're onto a winner priced at just over \$200.

Shane Baxtor



Kingston HyperX PC3-14400

With DDR3 memory gaining more momentum, we check out Kingston's latest.

Kingston developed the HyperX series a few years back and, while the series has been quiet lately, the better yields of chips now available for DDR3 means we're beginning to see the name back in the market.

The kit we're looking at today is the 2GB PC3-14400, which equates to 1,800MHz DDR, though Kingston has neglected to mention this on the box. Also not mentioned are the timings — 8-8-8-24 at 1.9V — pretty standard for modules of these speeds.

CONTACT	Kingston
ONLINE	www.kingston.com
MARKET	Everyone
PRICE	\$299

What's interesting is that this particular set, which has the part number '2GN' versus the standard '2G', is Nvidia SLI-certified. This means the kit will achieve the rated speeds on the 790i SLI-enabled chipset.

If you're looking for memory for your X48 motherboard, don't be deterred by this. Slotting the memory modules into our X48 test bed and adjusting the timings to the correct numbers allowed us to proceed with an overclock of our processor to a level that would let us run the memory at 1,800MHz.

As for going higher than the rated speed, we could only achieve a few more MHz by increasing the voltage above stock.

Fortunately, it was all good

news with the modules firing up and getting into Windows without any problems.

We then proceeded to test the modules in a number of applications that mainly stress out the CPU and RAM. This showed the memory is not only capable of getting into Windows at the rated speed but also runs stably under an intensive environment.

While a 2GB kit may not seem like enough for the user who is venturing into DDR3 territory, with the new Intel chipset supporting triple-channel memory, adding just one more module of the same memory will not only increase overall speed but make Windows Vista that little bit faster, without having to upgrade to a 64-bit version.

The \$299 price tag is reasonable, but it's still expensive when compared to entry-level 1,333MHz DDR3 kits.

Shane Baxtor

- ✓ Performs as it should; reasonably priced.
- ✗ Still expensive; only 2GB.

7
10



ASUS P5QL-E Motherboard

Who says you need to spend a fortune to get a great motherboard?



Not everybody wants to spend their pay on a motherboard. Some folks actually have weird things called lives, usually involving a wife, kids and a mortgage. While we lie awake at night, unable to sleep due to the immense pity we feel for them, the truth is they don't really miss out on much. With motherboards like the ASUS P5QL-E, they're getting most of the goodies we get but at half the cost.

For \$130, you can purchase approximately 76 stubbies of Victoria Bitter, or this Intel P43-powered board. While the VB will probably only last you a week or two, depending on whether it's cricket season, don't let the P5QL-E's price suggest that it too will be short-lived. Provided you're not going to jump on the Nehalem bus anytime soon, there's plenty to keep your middle-of-the-road PC happy for the foreseeable future.

Let's start with the P43 Northbridge. Like its bigger, more expensive brother, the P45, this chip supports a speedy 1,600MHz frontside bus. It's also got the newer PCI Express 2.0 lanes but is lacking the CrossFire support of the P45. The Southbridge is the ICH10R, which we didn't expect to see on such an affordable board. This offers a comprehensive range of RAID solutions (0, 1, 5 and 10) and there's even a single eSATA port. Considering the price point, it's no surprise to see that this board is built for DDR2, with the maximum officially supported speed of 1,066MHz, but if your memory can handle it you'll hit 1200MHz easily.

As far as cooling goes, the P5QL-E is about as sophisticated as a Coolgardie Safe; not a heatpipe or waterblock in sight, so it's not the best for extreme overclocking. But given the officially supported

1600MHz frontside bus, there's nothing to stop you from purchasing a 1,333MHz Core 2 Duo and cranking it up faster than Intel intended.

There's a single Gigabit Ethernet port on the same I/O panel as the S/PDIF, and Express Gate, which allows you to use email, internet, Skype, music and photos without booting into Windows, is also included.

Bennett Ring

CONTACT	ASUS
ONLINE	www.asus.com
MARKET	Everyone
PRICE	\$130

✓ Great performance; 400MHz overclocking.

✗ No advanced cooling.

9
10

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AOC widescreen LCD Monitor 2219P2

AOC is showing plenty of talent with their new screens.

The AOC 2219P2 is a sensational display — it delivers excellent performance, looks great and has solid features.

It's delivered in two parts — a base and the LCD. Putting the two together is easy and we were up and running in minutes. We connected the 2219P2 to our test system using the supplied DVI cable (there's a VGA lead as well). As the 2219P2 has in-built speakers, we also connected the screen to our computer's headphone port using the supplied 3.5mm cable. The display is matte, which means fewer reflections on the screen.

We tested with Passmark's MonitorTest tool. Colour quality was excellent, although we did find

that the whites had a slight grey tinge when testing with an all-white screen.

The 2219P2 rendered complex shapes well. We had to look closely to see any jaggedness and wouldn't expect any to be noticeable in real-world operations.

Video playback was excellent. We watched a couple of our favourite DVDs through the 1,680 by 1,050 display and were impressed. Response time is rated at 2ms. We couldn't see any blurring during fast-moving action sequences.

The 2219P2 is fully height-adjustable and can also be tilted



CONTACT	AOC
ONLINE	www.aocmonitor-anz.com
MARKET	Everyone
PRICE	\$349

✓	Great picture; highly adjustable.
✗	No USB ports or card reader.

8/10

through a 25 degree range. If you spend a lot of time working with documents, you'll find the 2219P2's ability to rotate from landscape to portrait mode a boon. At the screen's 22in size and high resolution you can easily view a full A4 page at one time.

We couldn't spot any dead or stuck pixels on our review unit. AOC's policy is that either three

stuck pixels, three dark pixels or a total of five non-functional pixels is enough for a replacement during the three-year warranty period.

So, what's missing? It would be nice if the display integrated some USB ports and a card reader. However, that's really fishing for something to criticise, as this display delivered on every measure.

Anthony Caruana

HP DreamColor LP2480zx Professional

HP delivers a real heavyweight — in every sense of the word.

While most LCDs are designed for consumers, there's a significant market out there for professionals looking for

exceptional colour definition who need more than a basic panel.

The first thing that's obvious with the LP2480zx is that HP takes

build quality very seriously. The unit comes in two parts: a base and the display. The base is solid and equipped with a slide-and-snap mounting system for the screen, making assembly very easy — although you may need a helper as the screen is very heavy.

The display has height and tilt adjustment, so it's easy to position it in the optimal viewing position. At its full height, it can be rotated into portrait mode making it ideal for viewing full-page documents. As the LP2480zx is being pitched at designers, the ability to view a full page at 1,920 by 1,200 on the 24in LCD is important.

Our benchmarking with PassMark's MonitorTest revealed some of the best results we've seen. The interfaces between

adjacent colours were sharp, with no blurring that we could see. Ellipses and diagonals were crisp and clean, with jaggies only noticeable when we got very close to the screen.

Video playback was excellent. HP doesn't publish response times, but we didn't have any trouble watching fast-moving action sequences from the DVDs we selected. There are no integrated speakers, but you can add an optional speaker bar made by HP.

While most monitors only offer the usual DVI and VGA connectors, the LP2480zx provides lots of options, with inputs for DVI, VGA, component and HDMI devices, and it can also be used as a four-port USB hub. Anything we'd like to see added? Perhaps some integrated speakers. However, that's getting pedantic as, after all, this is a computer display — and a darn good one at that.

Anthony Caruana



CONTACT	HP
ONLINE	www.hp.com.au
MARKET	Everyone
PRICE	\$599

✓	Stunning image quality; excellent build.
✗	No integrated speakers.

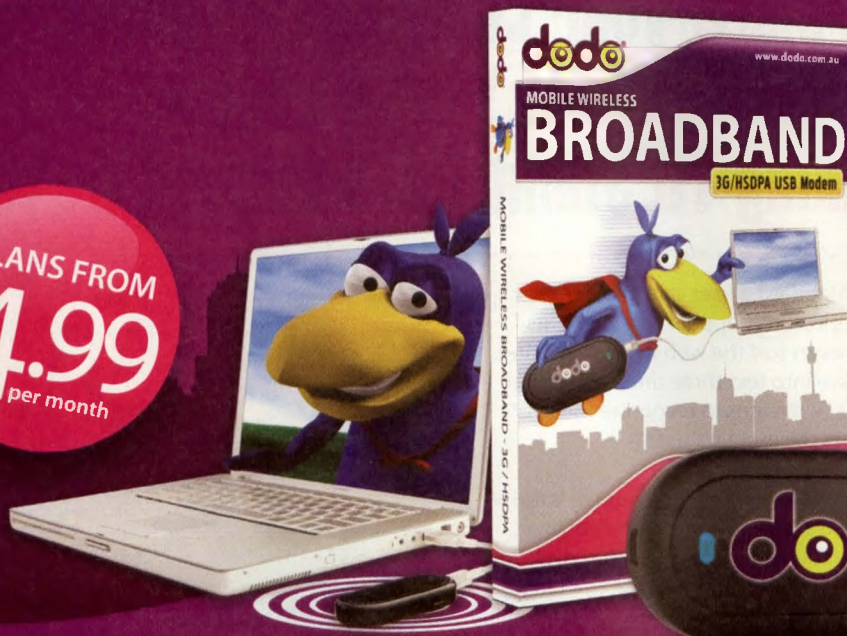
8/10



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Synology DS508 Disk Station

Running out of storage space with your present system?

With the volume of data we store and share increasing rapidly, so too is the need for a robust, easy-to-use data storage solution. While large companies can afford high-end servers and system administrators, the Synology DS508 gives similar capability to the rest of us.

The DS508 looks good. The plain front has just a few well-labelled LEDs and doesn't look like a complex piece of network equipment. We don't recommend sitting it at your workstation as the fans are reasonably loud, but it won't cause you too much bother if it's under the desk.

Connecting the DS508 to our test LAN was straightforward. It can be added to a Windows workgroup or domain and natively supports Apple's (now aged) AppleTalk protocol. With our test systems, the DS508 appeared in our network

browsers quickly and we could access shared folders easily.

The DS508 has two USB 2.0 ports and an eSATA port, which can be used for sharing other external drive units or printers. Creating folders, users and managing day-to-day tasks on the DS508 was simple with the unit's configuration tool. File copies, playback of media files and all the other tests we could throw at the DS508 were like water off a duck's back. The DS508 can also act as an iTunes server, and there's multimedia sharing via UPnP.

The DS508 delivers HTTP and HTTPS support along with DDNS, so that you can run your own web server, and the in-built web server also comes with MySQL and PHP, which means a small business only needs some open source software, a CMS and a little programming skill to create an intranet.

Anthony Caruana

• **CONTACT** Synology Inc.
• **ONLINE** www.synology.com
• **MARKET** Everyone
• **PRICE** \$1,550

✓ Flexible; easy setup; user-friendly.

✗ A little noisy.

8
10



D-Link DNS-343 Four Bay NAS

D-Link's experience with network gear shows with the DNS-343.



Setting the DNS-343 up was straightforward. Our review unit came without any pre-installed drives but installation is 100% tool-free. Simply lift the front cover off and slide the drives into place. Once the drives were in we plugged the DNS-343 into our router and powered it on.

The accompanying CD comes with D-Link's Easy Search Utility. This scanned our LAN

and detected the DNS-343 in quick time. Configuring the RAID was simply a matter of clicking the 'Configuration' button and following the prompts.

It's worth noting that the unit was quite loud and we couldn't work with it on the desk within a couple of metres of our work area. It might be possible to have it run a little quieter with different hard drives.

Software was easy to use, as most options are clearly labelled. As well as basic support for shared folders, the DNS-343 can be used as an FTP server and for sharing media as an iTunes server or via UPnP.

Data transfers from our test system to the unit, connected to our LAN via its Gigabit Ethernet

port, were fast, and video playback via Windows Media player using UPnP or the iTunes server was flawless. The DNS-343 appeared almost instantly on our Windows system in Explorer and our Mac's Finder.

We kept the unit running for several days and it didn't miss a beat. In case something does go wrong, the DNS-343 can be configured to send an email alert for a number of events, such as when there's no remaining space, there's been a disk failure or the admin password has been changed. It can also notify you of remaining space.

One of the greatest enemies of the modern hard drive is heat, which can distort a drive and lead to a failure. The DNS-343 can be set to send an email when the operating temperature reaches a specific threshold and then close down automatically.

Anthony Caruana

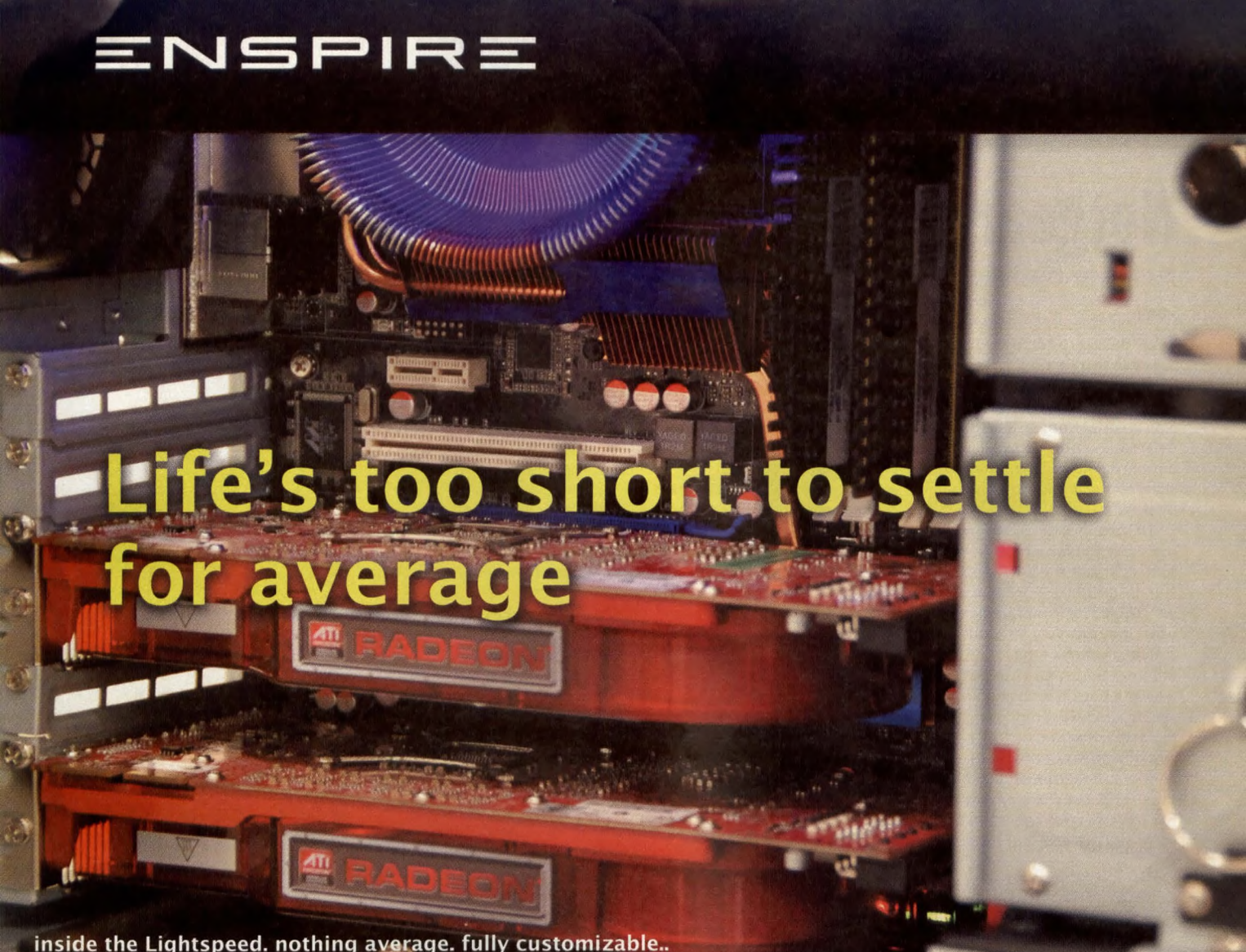
• **CONTACT** D-Link
• **ONLINE** www.dlink.com.au
• **MARKET** Everyone
• **PRICE** \$859

✓ Flexible; easy to set up; huge hard drive.

✗ Loud.

7
10

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Netgear RangeMax Wireless-N (WNR3500)

Netgear delivers a high-end router that gets close to networking nirvana.

What does a router need to deliver to compel you to upgrade to a newer model? We'd suggest that 802.11n and Gigabit Ethernet are two criteria worth considering. Netgear's WNR3500 delivers on both, but we'll need to dig a little deeper than the specs sheet to see if this router has what it takes.

Netgear has moved away from the short, flat form of most routers in that the WNR3500 stands upright, so it can be placed on a shelf. The front face has the usual indicators for network activity in each of the four Gigabit Ethernet ports and WAN port, as well as a button for using WPS for secure wireless setup.

Installation was straightforward, with the configuration utility being fully browser-based. The setup tool is run from a CD. We were a little surprised that the router's default

CONTACT Netgear
ONLINE www.netgear.com.au
MARKET Everyone
PRICE \$349

✓ Wireless range; performance.
✗ No USB port.

8
10

IP address and login details aren't on the printed material, which means most people will need to either guess the default address or run through the setup utility.

The Netgear SmartWizard was easy to use but wouldn't run unless the router was already connected to the internet. Given that we had no way of knowing whether the router was adequately secured before going through the configuration routine, we found this a little odd.

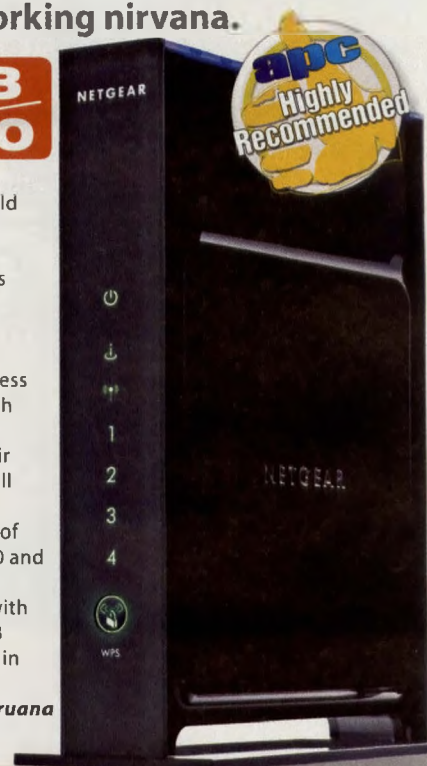
Once we gave the WNR3500 an internet connection, it started by checking the Netgear web site for the latest router firmware. The SmartWizard then guided us through setting up wireless security and we then had an

internet connection that could be used both wirelessly and with cable.

Wireless performance was excellent. We connected a Toshiba Portege R500 to the WNR3500 over Wi-Fi and managed to maintain a wireless connection for over 30m, with the Windows Vista signal strength only dropping to fair when we put a solid brick wall between them.

We also connected a pair of computers, the Portege R500 and an Apple MacBook Pro over Gigabit cable connections, with large files in excess of 350MB moving between computers in just a few seconds.

Anthony Caruana



Netgear Wireless-N + (WNR854T)

Netgear's WNR854T ticks most of the boxes when it comes to performance.

Given Netgear's long heritage, it's not surprising that they're delivering products that show a great deal of refinement both in regards to aesthetics and usability. The WNR854T is a great-looking router that, while skipping on some features, delivers great performance.

Setting up the WNR854T is straightforward with Netgear's SmartWizard, which guides you through all the steps, including connecting cables and powering-up your modem and router in the right order. The router needs to be connected to the internet for the setup to work, as it searches for updated firmware during the setup process.

You can access the router's configuration options by entering a simple URL in the address bar on your browser, although you'll need to look for a small slip of paper to find this out as there's little documentation provided. The user manual and setup guide are on the accompanying CD.

Settings and options, both within the SmartWizard and through the browser-based configuration screens, are clearly laid-out, with plain English descriptions. User documentation is provided on the CD and is easy to read.

Once the router was up and running we tested its wireless range and performance. Wireless

range was outstanding with a fast, stable connection maintained at 30m from the router using our Toshiba Portege R500 test system. Even at that distance, the slowest ping between the laptop and router was just 136m. As you'd expect from a device with Gigabit Ethernet, wired file transfers skipped along, with our test pack of 350MB files being shuffled through in just a few seconds each.

The WNR854T lacks QoS, which might be a significant factor for those into serious gaming or using services such as VoIP.

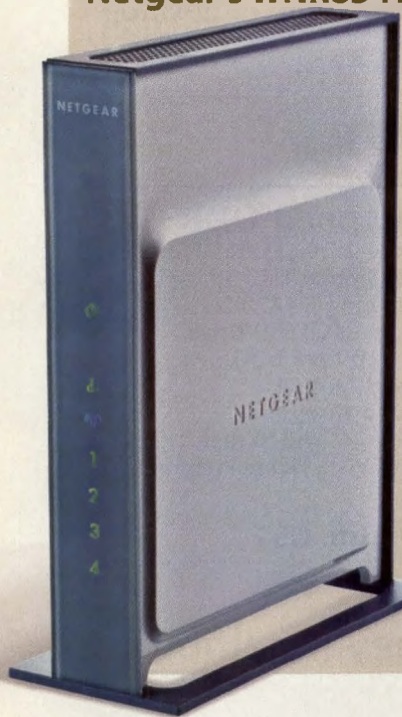
However, for home users we liked the ability to block certain types of traffic. For example, you could block access to specific services such as games that use particular UDP ports, particular URLs or sites that contain particular keywords.

Anthony Caruana

CONTACT Netgear
ONLINE www.netgear.com.au
MARKET Everyone
PRICE \$289

✓ Wireless range; performance; specs.
✗ No USB port.

7
10





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D-Link DIR-855: easy to set up and faultless in performance... it's just the price that's a problem.



D-Link DIR-855 router

The next big revolution in wireless networking is quad-band.

How do we define bands? D-Link says that its new DIR-855 consumer-orientated router is a 'quad-band' solution. The new box has the ability to perform Wireless N-class transmissions in the 2.4 and 5GHz bands of 802.11n, as well as the 5GHz 802.11a standard (most used in the US) and the 2.4GHz 802.11g standard that the large majority of Australians use. The quad-band moniker, therefore, is something of a clever marketing trick. Netgear's WNDR3300, for example, also connects to the same networks, but is only branded as dual-band.

Netgear may well have erred on the side of caution. Wireless adaptors can't currently connect to more than one network, so you need to manually select which band you want. In the future, we'd expect to see auto-switching adaptors.

BETWEEN THE BANDS

The way these routers are set up means that you'll be able to see two networks, providing you have an 802.11n adaptor. One operates at 2.4GHz, the other at 5GHz. The idea is that you can use the 2.4GHz network for general internet use, leaving the higher band network for applications such as HD video streaming and file transfers.

CONTACT	D-Link
ONLINE	www.dlink.com.au
MARKET	Everyone
PRICE	\$350

- ✓ Easy to use; top performance.
- ✗ Pricey.

7/10

As we've lamented before, the 2.4GHz band is extremely crowded, so for now, the 5GHz band provides an easy solution. 5GHz has 23 non-overlapping channels, compared to just three in the 2.4GHz band.

We'll start to see the 5GHz band used in a lot more routers over the coming months, but we'd also like to see the wireless adaptors improve, including the ability to connect to both bands simultaneously and route traffic accordingly. Media adaptors will also undoubtedly start to offer the option to accept incoming transmissions in either band.

It's worth reiterating that 802.11n is only going to get better. It's still not completely ratified, though any last-minute changes — which are unlikely to be major — will drip down within a firmware update. All the kits use the latest draft of 802.11g, which is perfectly stable for mainstream use — as borne out by the decision of an increasing number of consumer-orientated manufacturers (such as Apple) to plump for 802.11n-spec kit.

OLED DISPLAY

D-Link says that its kit differs from those offered by other vendors because it offers 'true concurrent transmission', with speed not affected if both bands are enabled. D-Link also claims a better quality of service (QoS) via its 'intelligent prioritisation technology' — but isn't that what a router is supposed to do anyway? All this basically means is that media traffic, VoIP and online gaming (which need fairly constant levels of bandwidth) are given a high priority, and wired and wireless traffic is also segregated.

Like other Wireless N kit, the DIR-855 also supports Wi-Fi Protected Setup (WPS), which is written into the 802.11n standard. It's a button on your router that enables it to auto-configure your wireless card without you having to enter settings. In our experience this is extremely hit-and-miss, and once again, it just didn't want to work here. This isn't a slight on the product though — we've often encountered this problem with WPS, and we expect to see it again.

The DIR-855 does have another

trick up its sleeve — an OLED display. We know from our experiences with Belkin's N1 Vision that a screen can be useful. You can use it to find out how much bandwidth is being eaten by those on your network, which is a useful tool to have.

CONCLUSION

The big question here is whether this router can justify its price. The short answer is no; compared with D-Link's standard 2.4GHz Wireless N kit, the benefits just don't make financial sense. Netgear's dual 2.4GHz and 5GHz product has been out for a few months now, and you can pick one up for well under \$200.

However, you are getting something extra for your money by plumping for the D-Link, and that's the OLED screen. It's quite simple to use and does the job it was designed for. Belkin's N1 Vision router is designed for those who want to flaunt their tech; this is far more subtle and functional.

In terms of performance, we couldn't fault the D-Link. It managed to stream HD comfortably over the 5GHz band while transferring files over the other network. We had no problems when configuring the unit, either. It's just the price that hurts.

Dan Grabham

Linksys' WRT610N Simultaneous Draft-N Band Wireless Router

Are two wireless networks better than one? Linksys' WRT610N includes both 2.4GHz and 5GHz connectivity in the same unit.

Nearly everything uses Wi-Fi these days. The downside to having everything sans cable is that there isn't infinite bandwidth available in the radio spectrum. If you're living in an apartment, you probably know the frustration of an overloaded 2.4GHz band.

Linksys has released the solution: a dual 2.4GHz and 5GHz 802.11 Draft N router, the WRT610N. It lets you pick and choose which devices to migrate over to the less crowded 5GHz band for increased throughput, while still maintaining

CONTACT	Linksys
ONLINE	www.linksys.com
MARKET	Everyone
PRICE	\$270

2.4GHz connectivity.

Linksys provided APC with the new WRT610N Simultaneous Dual-N Band Wireless Router and a USB WUSB600N Wireless-N USB Network Adapter with Dual Band for testing purposes.

Installation was hit and miss. A directed install process using the Linksys EasyLink Advisor ('LELA')

- ✓ Twin wireless networks; network storage.
- ✗ Software can't handle non-simple networks.

8/10

quick, easy and clean, detecting the WRT610N right off the bat and connecting to the 5GHz network without a hassle.

Taking it back to square one, we created a mini test network just for the WRT610N, using an ADSL modem/router (set to straight modem mode) and the two test systems. The initial installer went off without a hitch this time.

The APC office is crowded with 2.4GHz traffic, and our Wi-Fi suffers accordingly. On the 5GHz band there's very little, so we expected to see big differences between the two. When connected via the 2.4GHz band at around two metres distance, the connection ambled between 39Mbit/s and 109Mbit/s, transferring files at around 4.5MB/s. On the 5GHz band, our connection stuck mostly between 80Mbit/s and 122Mbit/s, with transfers at an average of 7.8MB/s.

Connection speeds and throughput dropped accordingly as we put space and walls between the router and the test system. We didn't see a huge difference between the drop-off of the 5GHz network compared to the 2.4GHz network as we put more obstacles in the way.

Nick Race



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Sony Bravia W-series KDL40W4000

One of the best LCD TVs around: high-quality picture and sound at a good price.

Sony's 40in KDL40W4000 is part of the new W-series, which also includes 46in and 52in models. It supersedes the 3000 series, which launched less than a year ago and promises several benefits over the older generation.

First up is the design. Sony calls it Midnight Blue — we call it glossy black, although if you look really, really closely you'll see blue flecks embedded within. Below the screen a speaker strip is suspended by a Perspex bezel. The stand lets the screen freely rotate horizontally.

The remote is mercifully uncomplicated, and navigating through menus is responsive and intuitive. This is partly helped by the new XMD system, which will be familiar to anyone who's ever used a PlayStation 3. Initial setup and adding channels is simple — just plug in an aerial and set the TV to autoscanner. Analogue, digital and HD will all be picked up thanks to the inbuilt HD tuner. It's then simple to set favourites, so you don't have to plough through all the chaff. Changing the channel is mercifully quick and responsive, even in HD.

CONTACT	Sony
ONLINE	www.sony.com.au
MARKET	Everyone
PRICE	\$2,699

The information display also offers minor EPG functions by telling you what's on and how long for. But that's it.

Bravia enthusiasts may lament the dropping of Colour Temperature controls. Now you're left with presets like Warm 1, Warm 2 and Cinema. But the 'Bravia 2' picture engine is impressive. There's no 100MHz functionality to improve panning, but the noise reduction really does remove most of the noise with minimal expense to sharpness. It also further improves its already-impressive upscaling of SD transmissions.

It took us quite a bit of fiddling with settings to suit the picture to our preferences, but the effort is worth it. Annoyingly, though, some settings reset themselves when you change channel.

Colour fidelity is very impressive. Colours are all rich, warm and vibrant when they're

✓ Best blacks around; great noise reduction.

✗ Not quite as vibrant as the best plasmas.

9/10

supposed to be — and not overpowering the rest of the time. We were very impressed with skin tones, both in our test movies and general TV viewing. A special mention should be made of the black quality: so long as you turn the Advanced Contrast Enhancer and Light Sensor off, black bars that frame widescreen movies are exceptional and detail in even shadowy areas is good. If your Blu-ray player supports 24fps playback then it will complement this TV too.

When watching footy in HD there is some motion blur when large and fast horizontal movements are displayed. Vertical panning shots also suffered somewhat. However, compared with many other LCD TVs (including 100MHz models), we were impressed.

We were also impressed by the audio quality. The 'S-Force' 'surround' speakers at the front do

an excellent job of filling a room with uniform audio levels. If you ever do get too much background noise you can make use of the Voice Zoom feature to boost vocal frequencies.

Other useful features include a USB Media Port for plugging in music and photographs. With photos your TV becomes an excellent digital picture frame, although we struggled to get our iPod working with it. As with many competitors, if you have similar Sony equipment then you can make everything work with a single remote. A full component of connectors is included (save DVI).

As to whether we'd buy it, it's certainly one of the best LCD TVs around. At \$2,699 it's reasonable value too, and the 52in version is 'just' \$4,699 (which is half the price of the 52in X-series when that launched). While ultimate desirability will depend somewhat on personal taste — Pioneer's and Panasonic's vibrant plasmas are mighty tempting — this should certainly be on your shortlist.

Nick Ross

BenQ W5000 home theatre projector

It's big, it's white and produces vivid 1080p images at a reasonable price.

One of the first things you notice about the BenQ W5000 digital projector is that it is big and white. Weighing in at around 10kg and measuring nearly half-a-metre across, this is not the type of projector you pull out of your case to display PowerPoint slides.

At the front of the projector is a large vent, an infra-red remote sensor and a large 135mm lens hood with focus and zoom rings. While the lens itself is only 40mm in diameter, the lens hood looks impressive and allows for polymorphic lens adaptors. The zoom ratio is only 1.2x.

The side of the projector has silver-coloured panels which curve around the back where the power cord socket, a power switch and the various inputs are.

Rated at 1,200 lumens, the images produced by the projector are bright and vivid, even in rooms with some lighting, although for

best image quality you want the room to be as dark as possible. The W5000 boasts a 10,000:1 contrast ratio, which meant that dark regions of movies still retained sufficient detail even when other parts of the scene were well lit. Image sharpness and resolution were excellent, with no noticeable pixel shift displaying 1080p test patterns. Colour rendition was excellent with no noticeable tints or shading.

We found the remote a little large in the hand, but it was functional. Unfortunately there is no backlighting, which makes the control hard to operate in a dark theatre room. Overall we found this unit produced very good images at a reasonable price. If you have the room and suitable high-definition video sources, the BenQ W5000 will delight. It's just a pity you can't get one in black.

David Neiger

CONTACT BenQ Australia
ONLINE www.benq.com.au
MARKET Everyone
PRICE \$2,999

✓ Vivid 1080p images; easy to use; quiet.
✗ Large; white only; rainbow effect.

8
10



Epson EB-1735W Data Projector

Priced at the business end of the market, this projector ticks all the boxes.

If you're looking for a premium portable high-resolution business projector and are prepared to pay for it, then the Epson EB-1735W data projector may be exactly what you need. Weighing in at less than 2kg, it has all the features a presenter would need.

Despite its small size, the unit has a 3LCD display engine, which produces bright, colourful graphics without any of the rainbow effect some people notice with

CONTACT Epson Australia
ONLINE www.epson.com.au
MARKET Everyone
PRICE \$3,699

✓ 3LCD display engine; no rainbow effect.
✗ Expensive; lousy sound limited zoom ratio.

8
10

competing DLP technology. It connects easily to PCs, composite and S-Video sources and, if you don't want to carry a computer around, allows you to run your presentation directly from a USB memory key or wireless network.

The front of the unit has the lens with built-in lens cover, manual focus and a

relatively small 1.2x zoom. The back has a single VGA input, S-Video and composite inputs, USB (Type A and B), Kensington key lock and mini jack audio input to drive the inbuilt mono speaker. The projector is fully compatible with Vista Network projector function, which allows it to be controlled directly from the computer over the USB link.

Setting up was easy and within

30 seconds of connecting to our computer we were displaying the presentation. The projector can also connect to USB devices such as USB drives, cameras and media players to display photos, PowerPoint, MPEG-2, MPEG-4 and WMV movie files.

The default colour setting was good, but the EB-1735W also gives you presets to enhance viewing for specific types of content including photo, presentation, theatre, game, blackboard, sRGB and text, plus a special sports presentation mode.

Our main gripe was with the sound. The inbuilt speaker is so quiet that it is, for all intents and purposes, useless.

However, if you want to give an impressive presentation with maximum flexibility of inputs and need a unit you can carry around with you all day, the EB-1735W is excellent. Just remember to pack a set of speakers!

David Neiger





AVerTV DVB-T Volar GPS USB Tuner Stick

Now you can watch TV without getting lost.

In a market filled with USB TV tuner sticks, AVerMedia decided to do something different by including a GPS in theirs. We have no idea why they would do this, but we assume it could be useful if you are travelling and only want to carry one device rather than two.

Physically, the DVB-T Volar GPS looks much the same as any other USB tuner stick, with USB connector on one end and antenna connector on the other.

The top of the unit conceals the built-in GPS patch antenna and there is a small socket on the side to attach an optional external GPS antenna. The supplied remote control fits nicely in the hand, with large buttons that are well labelled and easy to use.

Installing the DVB-T Volar GPS was straightforward. The software loaded without issue and the stick

quickly found all available digital channels. The supplied AVerTV PVR application allows you to watch TV, and record TV as native MPEG-2 or compress it in real-time to medium resolution (320 x 200) MPEG-4 for viewing on iPods and compatible media players. Native MPEG-2 recordings were flawless, while the compressed MPEG-4 recordings would be fine for the small screen but noticeably blocky on a monitor.

Since the stick only has a single tuner, it's not possible to watch more than one channel at a time, although the software does support Picture in Picture, to watch multiple instances of the same broadcaster (eg. ABC1 and ABC2).

AVerTV supports most PVR functionality including timer record, recording from the EPG and time slip recording to allow you to pause and fast-forward live TV. Unfortunately, external EPGs such

as IceTV are not supported, nor is it possible to remotely schedule recordings. The software also did not recognise our dual monitor configuration and only displayed TV on the primary monitor.

If you don't like AVerTV, the USB tuner is fully compatible with Vista Media Centre. The supplied PaPaGo GPS software is only a 14-day trial version unfortunately.

Overall this card performed well with digital TV. We liked the real-time compression to MPEG-4 and its compatibility with Media Centre. We're not too sure about the combination, as we'd probably prefer an analogue tuner and inputs to a GPS, but at least you have a choice.

David Neiger



Creative Aurvana X-Fi Headphones

Ideal for travellers who can afford them.

The Creative Aurvana X-Fi Noise Cancelling Headphones are designed for travellers who want excellent sound quality on the move, or people who want to enjoy their movies either on their laptops or home theatre systems free of

CONTACT Creative
ONLINE www.creative.com
MARKET Everyone
PRICE \$399.95

✓ Noise-cancelling; comfortable; sound.
✗ Expensive; large; leak sound.

6/10

annoying background noise.

The headphones come packaged in their own microfibre carry case, along with a set of AAA batteries, 6.3mm stereo adaptor and travel adaptor that works with many (but not all) airline sound systems. Weighing in at 245gm, the headphones are not portable enough to tuck into your pocket but will fit in a briefcase or notebook bag.

The headphones are comfortable to wear and feature large circumaural pads which totally cover the ears to provide the best-quality sound possible. The design of the headphones

themselves tend to block out much of the background noise, but for further testing we took them into our office server room and enjoyed the constant humming of our servers being reduced to a barely audible whisper. Virtually all of the bass noise was cut, leaving just the tiniest amount of hiss. With noise reduction turned off the noise was muffled, but present. Unfortunately, the noise reduction only seems to work against constant droning, as our tests found it ineffective against transient noise.

While we could hear some slight artefacts as a result of the noise reduction, they were minor. Of course, cutting out noise is only good if the sound from the headphones is up to scratch, and

the sound quality here was among the best we have heard from headphones in this price range. Treble was bright, without obvious distortion or sibilance, mid-range was well defined, making it easy to hear vocals, and bass was clean and powerful without being muddy, distorted or over emphasised.

We found the headphones comfortable to wear, but because they are snug they could be irritating if you wear earrings. A vent on the side ensures airflow so your ears don't heat up, but they also allow sound to leak out, which can be annoying for fellow passengers, especially if you have the volume up.

Overall, these headphones are great for travellers who want to listen to music or watch videos during long flights. However, at just under \$400, they are more for the business class end than the majority who fly economy.

David Neiger



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Apple iPod nano (4G)

Your current iPod nano? Out of date already.

The diminutive nano has undergone more design changes than any other iPod, and the latest fourth-generation version continues the trend by ditching the short, wide shape of its predecessor for a more conventional long, narrow design.

Apple has thrown in an accelerometer that kicks the nano into landscape mode when you hold it sideways to browse through your music and photo libraries.

It also allows for tilt movements when playing certain games and you can turn shuffle mode on by giving it a little shake. Storage capacities have jumped to 8GB and 16GB and the pastel hues of the 3G nano have been replaced with a

rainbow of nine vivid colours.

Wafer-thin at 6.2mm thick, with a domed front and back, and corners that are so pointy they're almost sharp, it looks as though it would snap like a dry twig if it didn't have a sturdy aluminium enclosure. We tried our hardest to break the little player in half, but there was no give whatsoever.

The new portrait-oriented display means Apple had to rejig the iPod's interface. It still uses the same split-screen visuals introduced in the last batch of non-touchscreen iPods, but content thumbnails are now displayed in a ticker-style row below the main menu. The 'Now Playing' screen has also been updated so

cover art takes up most of it.

The physical dimensions of the display haven't changed — it still measures 2in diagonally and has a QVGA 240 x 320-pixel resolution. It's not the same screen though — the whites are warmer, and when playing the same video side-by-side, we noticed colours on the 4G nano are more vibrant.

To test audio quality, we used our studio-grade Ultimate Ears super.fi 5 pros earphones and compared it to our current office favourite, the Samsung P2, as well as the 3G iPod nano.

We couldn't hear any difference between the two nanos, but plenty when compared to the Samsung P2. But then, you don't buy an iPod to get great sound quality — it's the many other talents it possesses that make it such a compelling media player.

Jenneth Orantia

CONTACT Apple

ONLINE www.apple.com.au

MARKET Everyone

PRICE \$199

✓ Great selection of colour options.

✗ Colours are a little faded.

8/10



Mio Moov 370

It's packed to the gills with the latest GPS goodies, but how does it measure up?

Mio's new Moov 370 portable navigation device boasts a swag of next-gen GPS features like a traffic message channel (TMC) receiver, 3D landmarks and online access to over a million business listings. But there's a world of difference between potential and real-world performance, and in testing we found it to be lacking in many key areas.

It comes preloaded with speed camera and school zone alerts, but the accuracy leaves a lot to be desired. It found no less than 14 school zones on a 40-minute drive from Glenwood to the Sydney CBD — the problem was, we were travelling on the decidedly school zone-free M2 motorway.

Another shortcoming lies in the way the Moov handles tunnels. As with every navigation device it loses its GPS signal, but unlike most of the latest models that simulate tracking so they can tell you the right lane to be in and exit

to use, it simply stops tracking and automatically switches from 3D mapping to text directions.

Full-screen dialog boxes are another irritation: by default, one appears every time you lose a GPS signal. Thankfully you can turn this off, but you can't turn off the dialog box that says your route involves one or more toll roads. We liked the notification the first time, but it repeats it whenever it thinks you've gone off course, and we once had to press OK three times within a five-minute period.

We were underwhelmed by the Moov 370's headline features as well. The TMC receiver needs a separate antenna that plugs into the side of the main unit and attaches to the windshield with suction cups. We found

coverage was patchy — especially further out from the CBD. The live points of interest database works well if you know the name of the business you're looking for, but there's no option to look up businesses by type.

Also, it only works if your mobile supports the Bluetooth dial-up networking profile — we had to go through three mobiles before we found one that supported it.

Jenneth Orantia

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✓ Large 4.3-inch touchscreen.

✗ No in-tunnel tracking; annoying dialogue.

7/10



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The mouse is available in a variety of metallic-pastel shades.



Logitech V550 cordless notebook mouse

Today's wireless notebook mice claim astonishingly low power consumption.

Energy conservation is officially a hot issue. It's considered every person's responsibility to scale back their power consumption, and there's no doubt that heavy computer users are priority one for the green lobby. The sheer amount of power consumed by a modern desktop makes an astonishing dent in both your carbon footprint and your electricity bill.

While desktops are becoming ever more voracious in their appetite, an opposite force is driving technology towards more frugal energy needs. The public interest in mobile technology, combined with a relative standstill in battery advancement, has resulted in ever more efficient chipsets, displays and peripherals. The introduction of the V550 notebook mouse from Logitech — which has a theoretical maximum endurance level of 18 months battery life from a pair of AA batteries — is endemic of a general push towards more energy-aware computing. The AA batteries haven't changed, but engineers are finding ever more elaborate ways to lengthen their operating window between charges.

The technologies that enable

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MARKET	Everyone
PRICE	\$99.95

✓ Stylish and good performance.

✗ Adhesive is a gimmick; wheel; spin wheel.

8
10

wireless mice to survive on such a meagre diet are a combination of tuned components and power-saving routines. The Logitech V550 benefits from an infra-red laser diode rather than the more widespread LED optical tracking solution. It's more expensive, but considerably less energy-hungry. That's not what they refer to as 'the science bit' though, because running either an optical or a laser diode continuously at peak performance would consume batteries mercilessly.

To get around this problem, most wireless mice are infused with scaling technology. This ensures that at any given point the mouse is only using as much power as is necessary. Most optical and laser mice typically use a four-stage scaling routine, with peak performance (and thus peak consumption) reserved for when the mouse is actually moving. Below that there is generally a fallback state for when the mouse is not moving — the sensor is still active, but pulsing and refreshing far less frequently, often between

five to 10 per cent of its peak diode pulse rate per second. Below that is a standby state, which is usually around 0.5 to one per cent of the high-end refresh rate. That's when you'll notice a delay in the mouse 'waking up' as you move it.

After long periods of disuse, the mouse may fall into a sleep mode that either refreshes at only a fraction of a percentage of normal or requires a button press to reactivate it.

This is the greatest saver of energy in modern mouse design, though sensor manufacturers also use other tricks. One tactic involves the sensor actively determining whether the frame rate can be reduced based on the surface the mouse is being used on. A matte surface with a consistent pattern would require a lower refresh rate than a glossy, plain surface.

Technology continues to march onwards, and a 2006 patent for an inertial mouse using an accelerometer similar to that of the iPhone claims that such a device would offer lower power

consumption and greater sensitivity than currently available technologies. Given the sophistication of current offerings such as the V550, that'll be an impressive feat indeed.

Logitech's V550 Nano mouse certainly looks the part, and the positively minuscule RF receiver that's smaller than the USB plug attached to it is designed to be fitted and forgotten. Performance wise, it's almost as impressive as it looks — movement is smooth and sensitive, if a little tardy to wake up from power-saving mode. While it's touted as a feature, the free-spinning mouse-wheel is actually a bit of an annoyance, given that it often registers a halt as movement in the opposite direction. Thankfully, with a firm click of the wheel's button it changes to a standard ratcheted wheel.

Bizarrely, it's the small adhesive clip designed to hold the mouse on to your notebook in transit that Logitech is making the most fuss about. While the adhesive is certainly firm enough, it's a gimmick that no doubt adds needlessly to the price. Otherwise, though, it's a stylish and functional offering for those who require greater accuracy than a touchpad.

Mike Channell



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Dragon NaturallySpeaking 10

Speech recognition is free in Vista, so should you pay for the latest DNS 10?

Speech recognition was going to be the saviour of personal computing 10 years ago. It would rescue us all from RSI and Carpel Tunnel Syndrome, and keyboards would only be needed for swapping guns in Crysis. Microsoft included an 'American accents only' recognition engine with XP, but the company took a step up with Vista to offer something much more purposeful that's built into every version of the operating system.

If you haven't discovered it yet, it's switched off by default and needs turning on from the Speech Recognition option in the Control Panel. For best results you'll need a good microphone, as sound quality is one of the key factors affecting recognition accuracy, but you can buy a suitable Andrea or Plantronics headset for around \$40 or so.

Speech recognition has two main uses. It can be used to control Windows and major apps such as Office, and it can also be used to dictate into word processors and email clients to speed up everyday correspondence.

Virtually everybody can speak faster than they can type, and there are added benefits, like reducing the strain on tired fingers and improving spelling.

Advocates of speech recognition often claim misspellings are a thing of the past when you switch, but this isn't quite the case. While it's true that you won't get any typing errors and all the words that you generate will be properly spelled, there are a lot more homophonic errors: for example, you say 'rows' but the software generates 'rose'.

Depending on the speech recognition software that you're using, there could also be a lot of 'misheard' words and phrases. This is where the software generates a similar-sounding but incorrect word. Small words cause most confusion, with 'a' and 'the' being easily transposed by most speech recognition applications. You might think that the two words

sound very different, but most people tend to shorten both in normal speech to 'uh' and 'thuh', which sound similar.

Recent versions of the leading third-party speech recognition program, Nuance's Dragon NaturallySpeaking, also try to improve accuracy by working on the context of words in a sentence, but this can be open to more unintuitive errors. When Dragon includes 'from a' in a sentence instead of 'of the', it's hard to believe that it's heard it wrong. Rather, the software evidently feels that 'from a' is more likely to be what you said in that sentence.

For some years, speech recognition applications have tried to improve their accuracy by looking through your emails and documents to build word lists which mimic your personal vocabulary. If the core of your writing is medical, legal or technical, this can make a big difference, but there are specialist versions of Dragon for the first two which include many technical terms. Sadly, there's no version yet for technology journalists.

However, Nuance started to move that way around a year ago by introducing a custom vocabulary service halfway through the life of Dragon Naturally Speaking 9. In exchange for a 500MB data file gleaned from your installation over several weeks, the company will create a customised speech file to improve accuracy still further. This service is now built into version 10 from the outset, so in theory all customers can have specialist versions of the software.

Speech recognition suits a certain type of person. Somebody who's prepared to give the software some training and learn the simple command sets needed to move around a document and edit it will benefit from the experience.

And those who are unable to type quickly will definitely find it useful and rewarding.

Simon Williams

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8
10

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Altech NRG Storm

Shop-overclocked, water-cooling, dual 280GTX video cards...

Weighing slightly more than a Nimitz-class aircraft carrier, and with the dimensions of a small office block, the Altech NRG Storm is not the kind of PC you can hide under your desk. With more neon than Vegas, a water-cooling kit that could have saved Chernobyl and a list of components that is the stuff of silicon dreams, it's the ultimate PC for gamers and benchmark-addicts alike.

At its heart, Intel's quad-core QX9650 CPU arrives pre-overclocked from 3GHz up to 4.2GHz, mounted on a 790i SLI motherboard. Altech has done this by upping the frontside bus to 1,600MHz — a quick and easy overclock. It's kept polar bear-cool by the immense Alphacool water-cooling kit, which is built seamlessly into the massive Antec case. The entire system is perfectly sealed, as we accidentally discovered when we unpacked the PC upside down. To our relief there wasn't a single drop of water released. There's a handy reservoir window on the front of the case,

CONTACT	Altech
ONLINE	www.altech.com.au
MARKET	Everyone
PRICE	\$4,899

allowing you to check that there's plenty of water at a quick glance.

Our only concern with the impressive cooling solution is the large number of fans, resulting in a relatively noisy PC. Unplugging a couple of the front fans helped remedy this, and the temperature remained perfectly safe. Given the fantastic cooling system, we reckon you could easily squeeze another 400MHz out of the CPU, but we were quite content with the speedy 4.2GHz for our benchmarks.

Altech has taken the Nvidia route with this beast, including not one but two Nvidia GTX280 video cards running in SLI. With a gig of RAM each, plus another four gigabytes of wallet-searing 1,600MHz DDR3 memory, this machine has more memory than a herd of elephants. Whether or not it's actually being used is the question, though, as the

- ✓ Best components; water-cooling; brilliant.
- ✗ Needs 64-bit OS; no HDTV card; expensive.

8/10

system uses the 32-bit version of Windows Vista Ultimate. No wonder CPU-Z only detected 2GB of system memory. To ensure you're really getting the most out of all of that memory, we recommend asking Altech to install the 64-bit version instead. Just don't get upset when a handful of your games refuse to boot.

The over-the-top specifications carry on to the whopping terabyte of hard drive storage, delivered by two zippy SATA II drives running in RAID 0 mode. There's even a Blu-ray drive in place of the regular DVD-ROM drive, though it's just for playback, with no burning capabilities. Finally, a Sound Blaster X-Fi XtremeGamer Fatal1ty Pro will guarantee perfect audio (when its rubbish drivers aren't causing the system to blue screen).

There's one glaring omission

though — a dual HDTV tuner. Geeks like to watch *Top Gear* almost as much as we like to fire up Warhammer: Online, so Altech needs to chuck in a good tuner to create the ultimate home entertainment experience.

Given its mind-blowing specs, you're probably wondering how the NRG Storm performs. Let's just say it's quite happy to run Crysis at maximum settings — while also encoding a DivX file, running a full system virus scan and curing cancer. The overall PCMark Vantage score was 7,287, while the 3DMark Vantage score impressed at a blistering 18,161.

Obviously you're going to pay through the nose for this kind of technology. At a hair under five grand, the price is quite reasonable given the water cooling, DDR3 memory and dual 280 video cards. But factor in another \$1,500 for a decent 30-in monitor and you end up with one prohibitively expensive PC.

Bennett Ring



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GOOGLE ON THE

Apple's iPhone is facing a formidable challenge from Google's Android operating system for mobile phones, writes *Alexander Gambotto-Burke*. Android could give Google a Microsoft-like stranglehold on mobile platforms.

Making its first public appearance on the HTC Dream phone, Android is arguably Google's most anticipated software project. It's an operating system for smartphones that differs from other phone OSs (like the Apple iPhone's or Nokia's Symbian) because it's designed from the ground up to hook your mobile into the internet. Even better, it's open platform, and already several mobile phone manufacturers have signed up to run it on their phones.

The implications of Android are biblical in their enormity. As the number of people who access the net via smartphones eventually exceeds those that do so through PCs, Google's Android could well become the dominant operating system of the 21st century.



TAKES iPHONE

HOW ANDROID CAME TO BE

Android's origins lie far outside Google's Mountain View headquarters, with entrepreneur and roboticist, Andy Rubin. Rubin began his career as an Apple engineer; he then joined offshoot company General Magic in 1993, where he helped develop Magic Cap, an ill-fated PDA OS that separated its various functions into 'rooms' (Office, Games etc.), implementing a kind of 'household' metaphor. After Magic Cap devices sold poorly, he moved onto Web TV (now MSN TV) before founding Danger Inc., a mobile software and services studio best known for its T-Mobile Sidekick smartphone.

His experience creating software for handheld platforms — not to mention his apparent dissatisfaction with remaining at Danger Inc. after the board dismissed him as CEO — led him to form Android Inc. in 2003, with Web TV colleague Chris White, ex-T-Mobile VP Nick Sears, and Rich Miner, co-founder of Wildfire Communications.

The company was geared towards creating a high-quality, open platform for mobile phones — an OS which developers (of any stripe), carriers and phone manufacturers could freely add to and upgrade. But the public didn't know this at the time and, when Google acquired Android in 2005, word was that the internet giant was planning to create its own smartphone — later thought to be a rival product to Apple's upcoming iPhone and dubbed, perhaps a little unimaginatively, the 'gPhone'.

In reality, Google's plan was far more ingenious. As CEO and Chairman Eric Schmidt puts it: "[This] is more ambitious than any single 'Google phone'. ... Our vision is that the powerful platform we're unveiling will power

thousands of different phone models."

In other words. ... one iPhone, thousands of gPhones. Google had been studying the smartphone market for some time — and developed software for several mobile platforms, including Symbian and BlackBerry's OS — but ultimately found it too disparate and disorganised. So Andy Rubin's project couldn't have come along at a better time.

"Android is a mobile platform that Google is working on because we needed it to exist, essentially," Dan Morrill, an Android Developer Advocate, told *APC*. "We took a look at the mobile space and realised that some of the things we wanted to be able to do — you know, some of the services and software that we wanted to deliver to users — were not really possible in the current landscape of the mobile industry. We're essentially building Android to be the platform that we wanted there to be."

LINUX-BASED

The OS itself is based on Linux, and allows developers to create model-specific or model-agnostic applications — or even refinements to Android itself — using a Java-esque programming language, which can then be downloaded and run by users of any Android phone.

Unlike with most mobile platforms, which contain an often prohibitive number of hoops through which developers have to jump in order to get their products to end users, Android is free to be customised on a whim. If this development





Android app #1 Rayfaria

Smoco's Rayfaria is a program that emulates a musical keyboard and contains a variety of music-based mini-games. Its tagline is 'Learn, Make, Play' and, true enough, users will be able to create their own tunes and learn by playing along to others.

model sounds familiar, it's because it's exactly the same way desktop PCs have been operating since people stopped treating 'internet' as a proper noun.

According to Morrill, the key to this is permission. "If you're an end user and you've got a browser," he reasons, "you open your browser and you don't have to get anybody's permission if you want to change that home page. You don't have to go to your ISP and say, 'Hey, look, I want to change the home page that's on my browser.' You don't have to go to your computer manufacturer

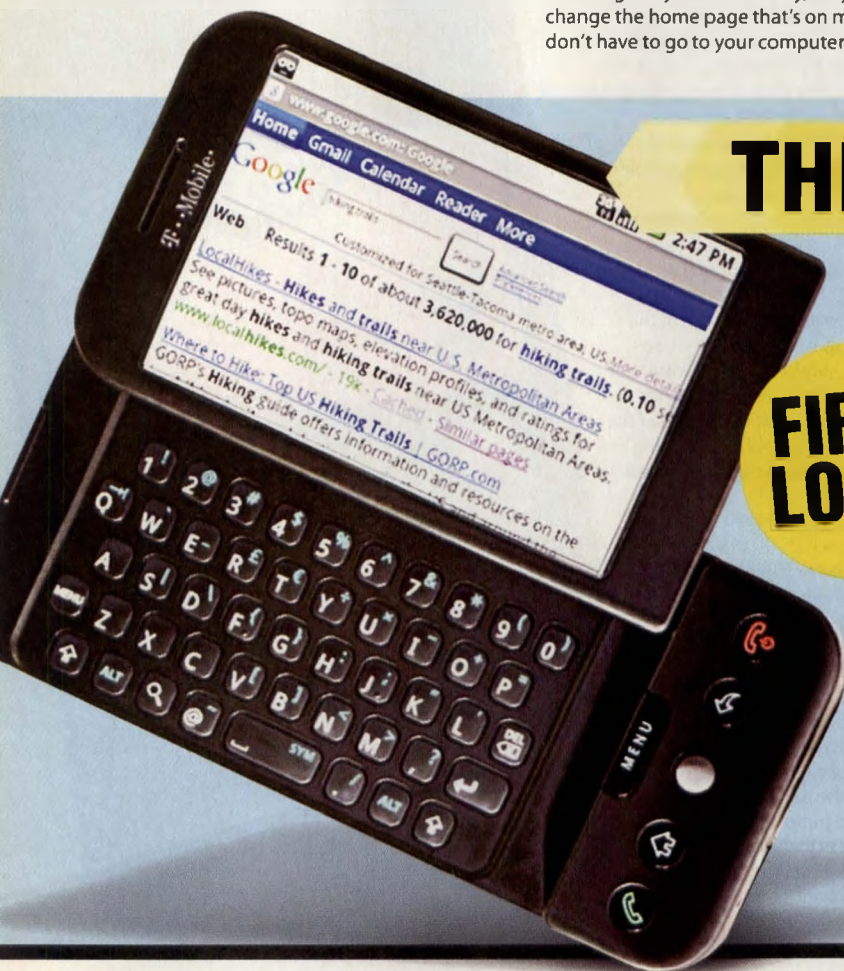
any time you want to install new software on your computer, and so on. That is an example of an open platform — or, at least, a platform that's open to end users. That is one thing that we, as Google, wanted to accomplish."

There's another level, of course. Just as users want the freedoms they have with their PCs on their smartphones, so too do developers. "On the PC," he continues, "we don't need to get anybody's permission to build applications and offer them to users. Similarly, it's also open to internet service providers in similar companies, who don't need to get anybody's permission to start up a business to provide connectivity to end users. These are the hallmarks of an open platform, and they're what made PCs and the web so successful. So, really, what Android represents is a way of achieving those same goals in the mobile space."

Considering this, it's easy to see just how wrong the 'gPhone' analogy really was. In fact, Google claims it will treat Android as just another mobile platform for which to develop software. To this end, Android is being designed so that the core programs Google develops for the system will not be given special treatment over third-party offerings. Any program end users can download will have the same level of access to both the OS and the phone's hardware.

And contrary to certain conspiracy theories, even Google's own features can be replaced if users find a better alternative. Of course, there

THE T-MOBILE G1



FIRST
LOOK!

After over a year of speculation, the "gPhone" has made its debut in the T-Mobile G1 in the US. Based on an HTC Dream handset, the phone may look like just another smartphone, but, in fact, it's a radical departure from traditional smartphones. In principle, it's more like a Windows PC: the OS will run on different handsets, and Google has already lined up several phone makers who will release hardware on which it will run.

Google developed Android under the assumption that smartphones are the new PCs of the 21st century. By design, Android offers users the kinds of services and facilities normally available on desktop PCs, including the ability to freely write and upload software.

For now, however, Google's main adversary in the smartphone war is not the PC, but Apple. From the streamlined UI to touch-controlled document handling and the hardware features themselves, the G1 is a piece-for-piece direct competitor to the iPhone. The first incarnation of Android, the T-Mobile G1 is a very competent iPhone rival.

The G1 is launching at US\$179, US\$20 less than the iPhone 3G. Google is believed to be in talks with the telcos in Australia but so far none of the parties are releasing details of any deals to launch the G1 or an Android-powered equivalent here.

has been some controversy surrounding just how open Android really is on this front. While it's true the bulk of the OS is completely open source, there are parts of it that remain closed and proprietary. Google has explained it will release all parts of the system under the Apache Licence and the GPL, save for those that interact directly with Google's own web services.

Ultimately, though, it's difficult to view Google's approach too cynically. It currently has no monetisation strategy for Android; it's giving the OS away for free to any manufacturer that will support it, and although it's as yet unknown whether the subsequent applications it develops for the platform will have a price tag attached, such is unlikely given the company's history. Basically, rather than controlling every aspect of a singular product (as Apple has done with the iPhone), Google's aim is to reap greater returns by making its phone technology ubiquitous.

FEATURE CONVERGENCE

In doing so, Morrill says, Google will create a convergence point for all the quality products and services in the mobile space that have been locked into specific platforms. "The issue isn't that the innovation isn't there," he clarifies, lest anyone accuse Google of hauteur.

"The problem is that the innovation wasn't there as a total package. For example, Opera makes very good web browsers for mobile phones — Opera Mobile and Opera Mini. End users can download them and install them on

their device, and use the web from their phones. But quality browsers aren't ubiquitous across mobile phones.

"Every individual mobile platform, every individual carrier, had bits and pieces of the total solution. You can look at every carrier and say, 'Company X is doing this right, and that's a really good feature there'. But for every time you say that Company X is doing something right, there's something else, usually, that kind of makes it a little difficult to have a true open platform.

"So, really, what we'd like to see is a platform that's open from end to end, to allow all of these

Android app #2 BreadCrumbz

Amos Yoffe's BreadCrumbz is essentially a travel-planning device, but instead of relying on maps, it uses pictures taken on-location. It certainly makes for a more instantly recognisable journey, although we've tried doing something similar with Google's StreetView, and the process is a bit awkward and time-consuming.



IT'S THE FIRST SMARTPHONE TO RUN GOOGLE'S ANDROID OS. WILL IT GIVE GOOGLE A WINDOWS-LIKE DOMINANCE OF SMARTPHONES AND RELEGATE THE IPHONE TO MAC STATUS?

The T-Mobile G1 has a 3.17in screen running at 480 x 320 and features both an iPhone-esque touch-screen keyboard, and a slide-out QWERTY keypad.

It's slightly thicker than the iPhone (by about half a centimetre), and a little bit heavier, too. It's fully 3G-compatible, but Bluetooth is reportedly underpowered in the first release of the Android OS. A 3.1-megapixel camera is available (an improvement on the iPhone's 2-megapixel one), and it has a MicroSD slot, which supports up to 8GB cards. It comes in black, white and brown.

Of course, the G1's key advantage over Apple's product has nothing to do with hardware or software tricks, and everything to do with Google. The Android phone acts as a simple, clean convergence point for all of the massively popular services Google offers — Gmail, Google Maps, Google Docs, Google Reader — that are disparately provided on the PC, and even the iPhone.

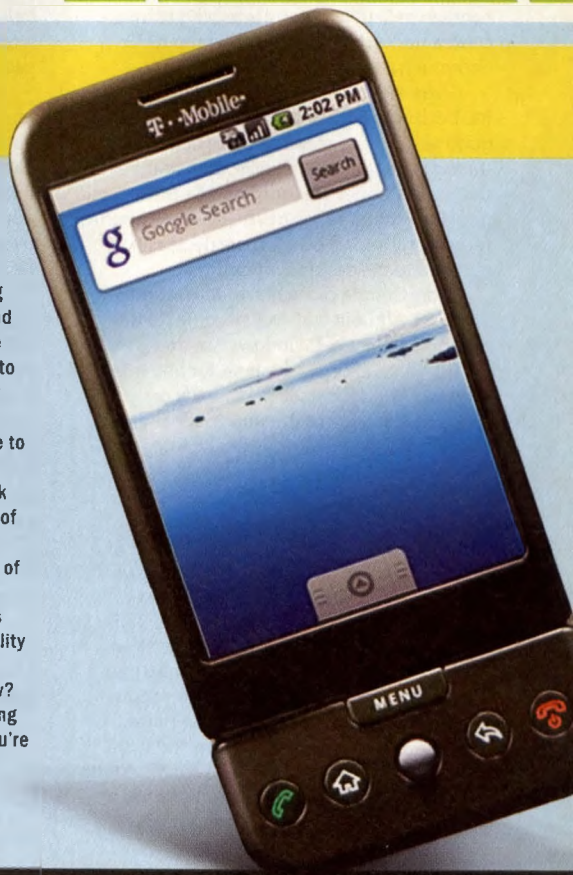
For heavy users of Google's web applications, the G1 will be extremely appealing — especially so if they're sick of carting their laptops around. The web has become synonymous with Google and the online applications it freely provides to users; with Android and the G1, users have access to all of Google's web services on a single device. An entire suite of

programs, basically, is available to G1 users in the cloud.

Beyond this, it's obvious that it's up to Android developers to make the most of this platform, and indeed make it the more appealing prospect over the iPhone. The driving force behind the Android OS, Andy Rubin took the stage at the G1's launch to explain: "A developer will be able to use it as a platform, and be able to develop their applications on the Android platform. But also, because of its openness, a developer will be able to modify the platform to make the platform better. Therefore, because the platform is open, we think Android is somewhat future-proof. It's future-proof because it has openness built-in."

As the platform improves, and as the number of applications for it grows exponentially, it seems impossible that Android won't eventually surpass proprietary platforms like the iPhone in both quality and basic quantity of available services.

But what does this mean for the G1, right now? If you're a staunch iPhone advocate, HTC's offering is unlikely to sway you; conversely, however, if you're in the market for a new smartphone, the G1's expected lower price when it's released here and comparable features will probably make it the easier sell.





Android app #3 FreeFamilyWatch

Provides families with a way of categorising locations based on their current 'safety'. It assesses crime rates, the presence of registered sex offenders, allergenic molecules and weather conditions to provide the user with the precautions they may need to take before letting family members (children, one assumes) roam free.

Dan Morrill, Android Developer Advocate.

innovations that are kind of scattered across various carriers, various hardware manufacturers, and various phone operating systems, to kind of allow them to come together in a perfect storm of innovation, on a mobile device."

To ensure this happens sooner rather than later, Google has formed the Open Handset Alliance. Established in November, 2007, the Alliance consists of 34 key players in the smartphone business, including carriers such as T-Mobile and Sprint Nextel, manufacturers (Motorola, Samsung, HTC, LG), semiconductor companies like Nvidia and Intel, and software companies such as eBay, SkyPop and NMS Communications.

Given the size of the Alliance, it's clear Android has become a high priority at Google, and with good reason: one of Rubin's core beliefs throughout Android's development has been that smartphones are usurping PCs as the world's primary internet-ready device. As smartphone technology improves, users are decreasingly tethered to the desktop model.

And if Google can achieve what Morrill suggests, Android may well become for the mobile market what Windows was and is for the PC. That's except, of course, for one small problem: Windows itself has already carved out a substantial section of the smartphone market, and doesn't show any signs of slowing down.

WINDOWS MOBILE

"Windows Mobile is coming off a strong 2008 fiscal year, selling more than 18 million licences globally," Scott Rockfeld, Windows Mobile's Group Product Manager, reports. "We nearly doubled the overall growth of the market, meaning we are continuing to take market share from competitors. We also had triple-digit year-over-year growth in various key regions, such as Latin America, France, Central and Eastern Europe, Japan and India. We expect strong momentum to continue with more than 25 Windows Mobile 6.1 phones or upgrades expected to hit the market by this

holiday season."

It's not difficult to understand Rockfeld's confidence: Microsoft has made a concerted effort to reclaim some of the ground it lost with the growth of the internet, and its strong presence in the smartphone industry has proven extremely profitable. And on paper, at least, Mobile's core concept isn't too dissimilar to Android's — for the end user, anyway.

"Microsoft believes in Android's current strategy," Rockfeld explains, "which is delivering software and services and working with many partners to deliver each phone."

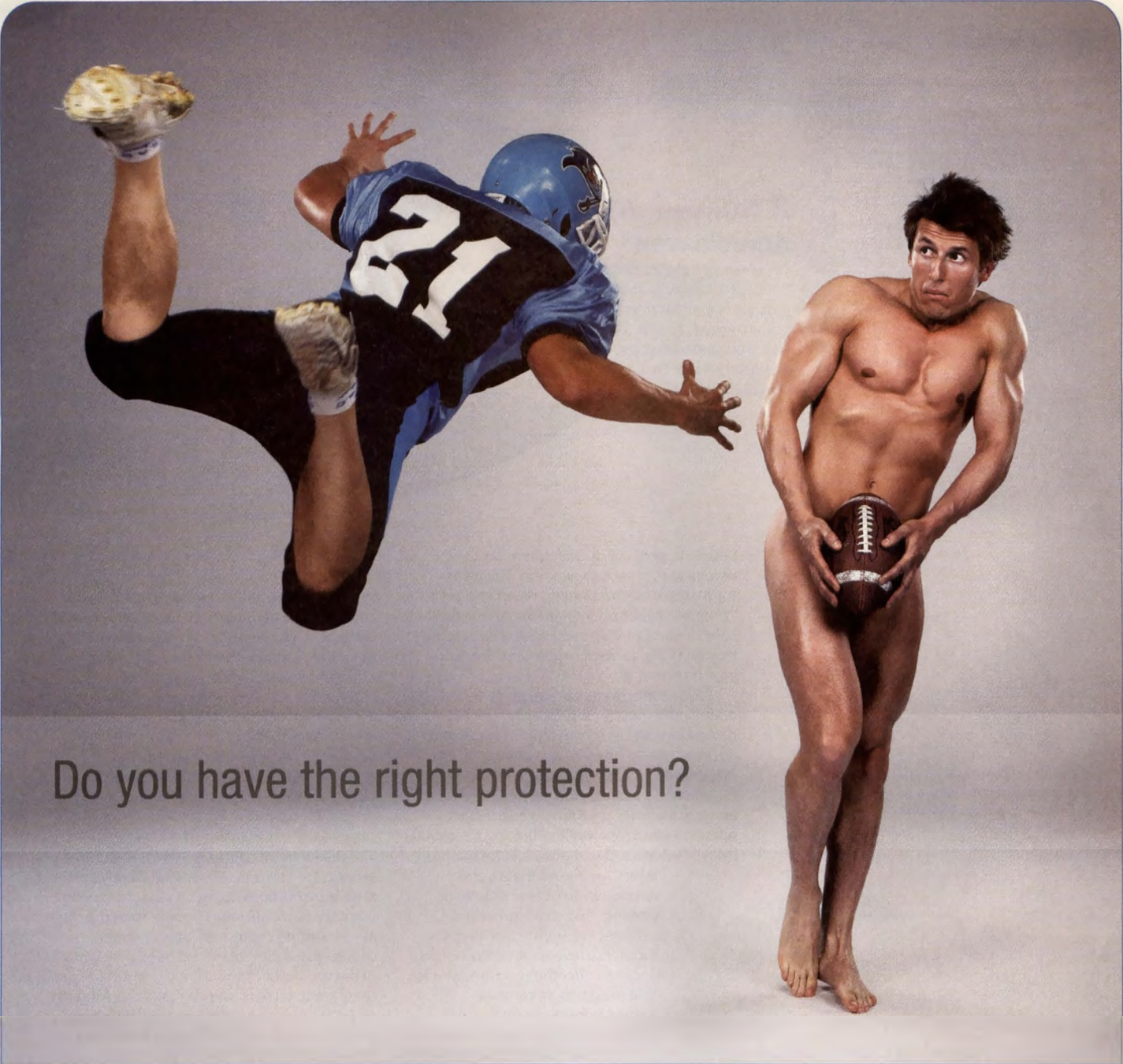
However, he's also ready to illustrate how Mobile's proprietary structure — not to mention greater spread — confers many advantages over Google's entrant. "There are a number of advantages Windows Mobile has over competitors for all audiences," he says.

"They centre on our belief that the individual should be at the centre of their mobile universe. Through our partner-based platform, people from anywhere around the world can have a unique mobile experience with Windows Mobile software and services. Today we partner with 56 handset makers and 160 mobile operators globally, so people can choose the best phone, carrier or price that works best for them.

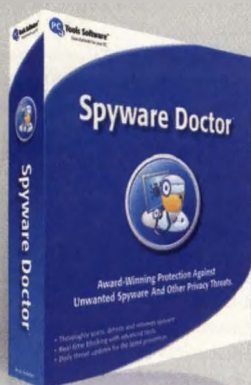
"But choice doesn't end there," he continues. "The 18,000 Windows Mobile applications available allow



Google on Google:
Street View per Android.



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Android app #4 Androidscan

The winner of Google's first Android Developers Challenge shows what's possible. AndroidScan uses your phone's camera to scan a barcode, locate product reviews and tell you whether the same product is cheaper in other shops nearby.

Scott Rockfield,
Windows Mobile's
Group Product
Manager.

Android's signature logo may be twee, but the significance of the new platform is definitely serious business.



people to personalise their phone so it's unique to them and their needs. This also translates to business needs. When you get a Windows Mobile phone, you also know it will have the best-in-class security and be accepted by your IT department so you can connect to your business."

Beyond this, of course, are the general issues open-source platforms have always faced. "As we have seen with Linux consortiums in the past," Rockfield notes, "open-source platforms have faced several challenges, including fragmentation. By contrast, Microsoft has taken an open platform approach, which includes open-standard APIs, while collecting no royalties from developers. Our approach helps handset makers, mobile operators, and developers to differentiate their offerings and create great and consistent experiences for all our customers. This also allows Windows Mobile to offer the security features that most people come to expect from Microsoft."

Rockfield's confidence in Windows Mobile may be a little surprising given the commonly-held belief that Apple has the potential to lay claim to the majority of the market, as it has with portable media players. Indeed, the browser overhaul Microsoft will be introducing later this year for Windows Mobile phones appears to be a direct response to the iPhone's superior browsing capabilities.

And, possibly as early as next year, Microsoft plans to release its new smartphone OS, Windows Mobile 7. If there is a smartphone war, it's clearly becoming increasingly about software over hardware. (And once

again, this shift in focus mimics the history of the PC.) The iPhone has been praised for its streamlined, stylish, and responsive interface, and Google is going to have to deliver something of equal, if not greater, quality; its massive potential as an open platform is, after all, of little consequence to the average buyer.

The core software included with the Android OS will have to meet similar standards, although Morrill notes that Google has an immediate advantage here: its widely-acclaimed networking, media, and office software are all readily available to users in the cloud.

CHALLENGE OF THE UI

The challenge, of course, is in getting those services to work naturally and efficiently on the mobile platform. And that's a bigger task than you'd think. Morrill raises Google Spreadsheets as an example. "You know, that's a rather sophisticated user interface," he says. "If you think of the spreadsheet, there is a big grid of cells, and there are scroll bars, and you can enter formulas, and you can change the background colour of cells. There's all this functionality, and even though it's a very familiar interface to anybody who has ever used a spreadsheet, if you think about it in an objective, absolute sense, that's a very complicated UI."

"It works well on the browser because you've got enough space in the screen, and you can fit all this stuff in there. You've got a nice pointer, and you can move it around, and click on things, and you've got a full-sized keyboard. So on the web, that model actually works very well."

On a phone? Not so much. "You've got this tiny little window," Morrill explains, "and you're trying to fit this rather sophisticated user interface into that tiny little window. That is kind of the fundamental — I would say — tug-of-war that goes on when you ask the question, 'Should you be building an application for a web browser, or what I call a native experience integrated into the mobile device?'"

"Say I've got a spreadsheet and I've got a



▶ Android's Photo Grid photo viewer.

Android app #5 Wikitude

Wikitude provides travel information based on where you are. Other apps in development include applications for keeping tabs on employees, GPS-enabled games, child-tracking systems and a combination of satnav and a to-do list that plans your day based on where you need to go.



bunch of rows in it, or something like that, and perhaps this is like an expense report. I'm on a business trip, and I'm just using a spreadsheet to track my expenses. If I'm carrying a laptop around with me, then it's probably not a big deal for me to get online and go to Google Spreadsheets and add a row to that thing.

"But if I've only got my mobile phone with me, is the best user experience really to open up a browser on that phone and then go to Google Spreadsheets and try and navigate around a full sized spreadsheet in this little mobile application or in this little mobile-sized web browser? Or is the better experience to have a native application that's well-integrated with the device, that's able to present like a mobile-optimised user experience? What we're finding is that there is no really globally applicable answer to that question."

This is a balance Android users will find for themselves. After all, if the interface benefits of using mobile-optimised software are an obvious advantage in some instances, in others it may be a cumbersome and superfluous alternative to what's already available in the cloud.

"If you take Google Reader as an example," Morrill suggests, "what that does is let users sign up for a bunch of blog feeds, or what have you, out of the internet, and they kind of get pulled into a single place. There is kind of a hidden advantage to this, and that is that your computer only needs to make one connection. That connection is a network connection to Google's server, and from that, you see all of this information that you get from all these feeds you're subscribed to."

"If you were to go to a mobile device and build a mobile application that is a feed reader, you're suddenly going to have to make all of those connections to those other blogs from the device. And if you're a power user of RSS and you've subscribed to, like, 150 blogs, your mobile device is going to have to make 150 different connections to servers. If you think about this on the carrier's network —

these are typically not the highest bandwidth networks in the world. So, that is not necessarily going to lead to a good user experience."

While Morrill is eager to keep a question mark on these topics, this doesn't mean Google isn't actively exploring possible answers. Having released a preview version of the Android Software Development Kit online in November last year, Google is now holding a global Developer Challenge contest as a means of exploring the solutions third parties will be creating. The 50 winners of the first phase have already been announced; each team has won US\$25,000 for their troubles. A further 10 will receive US\$275,000 each, and another 10 will receive US\$100,000.

If nothing else, it should be apparent through such efforts that Google is dedicated to building — or at least erecting the scaffolding for — the ultimate open, customisable, efficient smartphone platform available. Whether it will be able to achieve the same level of mainstream penetration as the iPhone or Windows Mobile phones is as yet unproven, but there are many reasons to hope it does.

Android promises to unshackle development and end user experiences on the smartphone, and in doing so will evolve the mobile platform so that it can finally achieve parity with the services PCs provide. **ETC**





IPHONE CHALLENGERS

The gPhone won't be released in Australia until next year. In the meantime, the major phone vendors are taking on the iPhone with their own creations.

Smartphones aren't just for geeks and business users anymore. Increasingly, they make up the premium end of the mobile phone market, with advanced web, email and multimedia functions.

A good starting point in narrowing your selection down is deciding what your priorities are. If you're mainly after a phone for email,

handsets with full QWERTY thumbboards are the best choice, and if you're connecting to a corporate email account, check that it supports your company's mail platform.

Multimedia buffs should ensure it has a 3.5mm audio jack for plugging your own headphones in, and support for Bluetooth A2DP is handy for streaming music wirelessly to

compatible headphones, speakers and car stereos. You'll also want a memory card slot for adding more storage, or at the very least a good-sized flash drive built-in.

For road warriors, long battery life is key. This is one area where smartphones fall behind on regular mobiles, as battery-sucking features like HSDPA, Wi-Fi and large high-res

screens mean you'll be lucky to get three days of use between charges. All smartphone operating systems have a decent amount of third-party programs available, but if you're a power user and like to stretch a device's capabilities to the fullest, platforms like Windows Mobile and Symbian will give you the flexibility you're after.

new and improved favourite

BlackBerry Bold

RIM's latest mobile email machine is the most addictive CrackBerry yet, with built-in Wi-Fi and GPS, a stunning screen and native DivX/XviD playback.

BlackBerrys have always been the best choice for mobile messaging, thanks to their ultra-efficient email delivery and no-nonsense user interfaces, but the Bold bumps things up a notch (or three). It features the road warrior's holy trinity of HSDPA, 802.11b/g WLAN and GPS, putting it on par with every other high-end smartphone — and there are other features that cement its position as the best mobile email device on the market.

If you're after a sleek handset that'll easily slip into your back pocket, however, you'll need to look elsewhere. The Bold is chunky, and at 136g, it's not exactly light. But in our opinion, it's a small price to pay for what you get with the extra weight — namely a large high-res screen, comfortable thumb-board for typing, and a large 1500mAh battery that's good for around two days of use.

The Bold's 2.5in LCD display is so bright and vibrant we almost thought it was a fake screen. A high 480 x 320-pixel resolution makes everything look exceptionally sharp and clear, and colours pop off the screen. Running the latest BlackBerry OS 4.6 operating system, it gets the benefit of new icons that use outlines instead of fill-in colour, although the rest of the user interface is essentially unchanged from previous versions.

Other changes include support for HTML email, a revamped web browser and media program, and the inclusion of Docs To Go Standard. Technically, you'd need to spring extra for the Premium version of Docs To Go to create a Word, Excel or PowerPoint file from scratch, but a simple workaround is keeping blank files of each format that you can edit at a later stage. If you've got files in the Office 2007 format, however, you'll have to upgrade to Premium to be able to view them.

RIM has been steadily improving the multimedia functions on each successive BlackBerry since the Pearl, and the Bold finally knocks it out of the park with a set

of features that's better than most portable media players. The updated Media application is a slick front end for managing music, videos, ringtones, photos and voicenotes, and the list of supported codecs includes MP3, WMA, AAC, DivX, XviD and H.264. The external speaker is plenty loud for private listening, and there's also a 3.5mm earphone jack and Bluetooth A2DP for wireless headphones. A healthy 1GB of storage is included, and you can supplement it with a microSD card.

We were also pleasantly surprised by the quality of photos from the built-in two-megapixel camera. With natural lighting and a steady hand, colour tones are accurate and details are remarkably clear. There's no auto-focus or macro mode, though, and the LED light isn't strong enough for proper night-time photography. Conversely, video recording is heavily pixellated, so much so that it looks like a special effect.

Any email-centric smartphone lives and dies by the comfort factor of the built-in keyboard, and we're happy to report that the Bold's QWERTY thumb-board is the best one we've ever used. Ridges on each key and a soft, cushiony tactile feedback make typing on the Bold an absolute pleasure, and it's helped along by a system-wide spell-check that underlines any words that look like typos.

The inclusion of both HSDPA and 802.11b/g WLAN makes the Bold an excellent candidate for wireless web surfing, but its browser left us feeling distinctly underwhelmed. Basic web pages loaded fine, but pointing it at a site with lots of scripts and graphics — like apcmag.com — would cause the entire system to hang. Plus, there's no support for tabbed browsing.

Sadly, there's still no mapping software to use with the Bold's GPS feature, unless you count Google Maps. Even the built-in BlackBerry Maps program doesn't have any local maps for Australia.



CONTACT	BlackBerry
ONLINE	www.blackberry.com
MARKET	Everyone
PRICE	Depends on carrier

✓ Excellent keyboard; high-res screen.

✗ No GPS; bulky size; poor web browser.

**8
10**

the starter smartphone

Samsung i200

It's one of the cheapest Windows Mobile smartphones to date, but is that enough for the i200 to compete with its full-featured cousins?



CONTACT Samsung
ONLINE www.samsung.com/au
MARKET Everyone
PRICE \$549

✓ Slim; bundled Bluetooth headset; easy to use.
✗ Generic design; headphone jack.

8
10

Samsung doesn't beat about the bush when it comes to the i200's target user, with 'My Very First Smartphone' labelled plainly on the box. The slogan sounds a tad Fisher Price, but it reflects the phone's appeal as a basic smartphone for users upgrading from a feature phone for the first time.

It runs Windows Mobile 6.1, but it's the less-powerful (and easier-to-use) Standard version that doesn't rely on a touchscreen for input. Instead, you get a traditional five-way navigation controller and numeric keypad, with two soft keys, home and back buttons, and a 2.3in QVGA display.

There's nothing fancy about the i200's appearance, but it'd be a stretch to call it ugly. We did find its design a little generic — almost

like it was an unfinished engineering sample rather than a final product — but it feels great in the hand thanks to its slim dimensions and rubberised coat.

Befitting its status as a 'starter smartphone', it's missing typical power-user features like GPS and 802.11b/g WLAN, but it comes with Bluetooth 2.0 + EDR with full support for stereo streaming, file transfer and wireless ActiveSync — and even a Bluetooth headset in the box in addition to the standard wired headset.

By default, the home screen features a sliding panel interface that lets you access appointments, songs, photos and settings without needing to launch separate applications, but we found it too laggy for full-time use. Samsung includes no less than 14 other layouts to choose from, including the clutter-free Samsung Wizpro.

Considering Windows Mobile in general gets a beating for being too slow and difficult to use, we found the i200 remarkably straightforward. The 'Recent Programs' feature is handy — when you hit the Start soft key from the home screen, you're presented with a three-by-three grid of the nine most

recently used applications. If you need a program or setting that's not included, hitting the All Programs soft key brings up the full menu.

As with Windows Mobile 6 Professional, the Standard version comes loaded with most of the applications you need to get started, such as Internet Explorer, Windows Media Player, email and PIM software and Windows Live Messenger. Those new to mobile email will appreciate the email setup wizard.

The i200's keypad is a good size for comfortable text entry, and the individual keys have good bounce and travel. It's not as good as a full QWERTY thumbboard for writing long emails and text messages, but the built-in xt9 predictive text software does a decent job at minimising keystrokes.

The web browser is essentially identical to the Internet Explorer on WM6 Professional smartphones. In other words, it's nothing to get excited about, with no support for tabs and patchy support for Javascript. Loading the apcmag.com web site in full took nearly eight minutes over 3G.

Multimedia on the i200 is more of a nice-to-have than a killer feature, since the headphone jack uses the proprietary Samsung connector. Built-in storage is a minimal 25MB, but it comes with a bonus 2GB microSD card in the box. Streaming YouTube videos in full-screen view is possible thanks to the PVPlayer, but we'd suggest saving your data for other apps: there were too many pauses for buffering and rendering issues to make it an enjoyable experience.

The i200 runs a relatively slow 264MHz processor, resulting in brief lags when moving between some applications. But for the most part, we were satisfied with its performance. In keeping with the phone's slim physique, Samsung has only put in an 1,100mAh battery, but the small display and slower processor means this can stretch out to a reasonable 2-3 days of medium usage.

cramping its style?

Palm Treo Pro

Those suffering from BlackBerry boredom will find more power and flexibility in Palm's corner of the playground.

Stylism was never a high priority in Palm's Treo line of devices, but with the iPhone 3G and Touch Diamond raising the bar, every other vendor has had to sit up and take notice. A product of this new-found emphasis on aesthetics is the Palm Treo Pro, which is slimmer, glossier and far more eye-catching than any of the Treos before it.

From the back, the Treo Pro's glossy black casing bears an uncanny resemblance to the iPhone 3G, albeit with the etched silver Palm branding instead of an Apple logo. Everything about the Treo Pro looks contemporary, from the flush 320 x 320-pixel screen and glowing call keys to the five-way navigation pad that's cleverly disguised as the Palm logo.

But the Treo Pro's good looks come at the expense of a few creature comforts, most notably in the thumb-board area. Palm could've gotten away with larger buttons with better tactile feedback in the space available, but it wouldn't have looked as stylish. The small, gummy keys on the Treo Pro are a challenge — even for small hands — and you have to use the tips of your fingers to prevent accidentally hitting the neighbouring keys.

The Treo Pro's QWERTY thumb-board means you inevitably get the 'Is that a BlackBerry?' question. Email delivery isn't as straightforward and efficient as a BlackBerry, but the Pro holds it own as a messaging device.

Push Email over Microsoft Exchange is supported, and you can also configure it for web, POP and IMAP accounts using a wizard that automatically fills in the server details for most mail services. Rich-text formatting and HTML are supported, as are all major attachment types.

The photo speed dials we enjoyed in the Treo 750 (the Pro's predecessor) are conspicuously absent; however, the Treo Pro does have a few extra software features, like a screensaver clock that appears when it's in standby and a task

manager for shutting down programs and jumping between open applications.

Telstra users have access to the Whereis Navigator service for turn-by-turn directions using the built-in GPS, but it was having teething problems at time of writing; we were able to install it in our test unit, but we kept getting an 'authentication failed' error message when trying to run it.

The Pro is the first Treo to include GPS and 802.11b/g WLAN and, like the Treo 750, it offers quad-band GSM, tri-band HSDPA and Bluetooth 2.0 + EDR. One of the perks of a Windows Mobile device is that there are virtually no limitations on how you use the wireless functions.

Data connections can be tethered for use as a wireless modem on a laptop, files can be downloaded directly to the device, and a rich library of third-party software lets you use it for everything from downloading files over BitTorrent, talking to friends over Skype, and streaming internet radio. For web browsing, you'll want to install the excellent Opera Mobile 9.5, as the built-in Internet Explorer is really only good for mobile-optimised sites.

A button on the Treo Pro's right-hand side lets you quickly toggle Wi-Fi on and off, but we found ourselves using it more for the former, as an aggressive power-saving feature automatically switches it off after brief inactivity. We also found a bug with the Bluetooth function that lets you send but not receive files over Bluetooth.

The Treo Pro is reasonably responsive thanks to a 400MHz Qualcomm MSM7201 processor and 128MB of RAM, but there are occasional lags when launching new programs and waking it up from standby. The removable 1,500mAh battery is one of the largest in its class, but don't expect a week-long run-time — with medium use, we were averaging around two days between recharges.



• CONTACT Palm Australia
• ONLINE www.palm.com/au
• MARKET Everyone
• PRICE \$929

✓ Distinctive design;
wireless features.

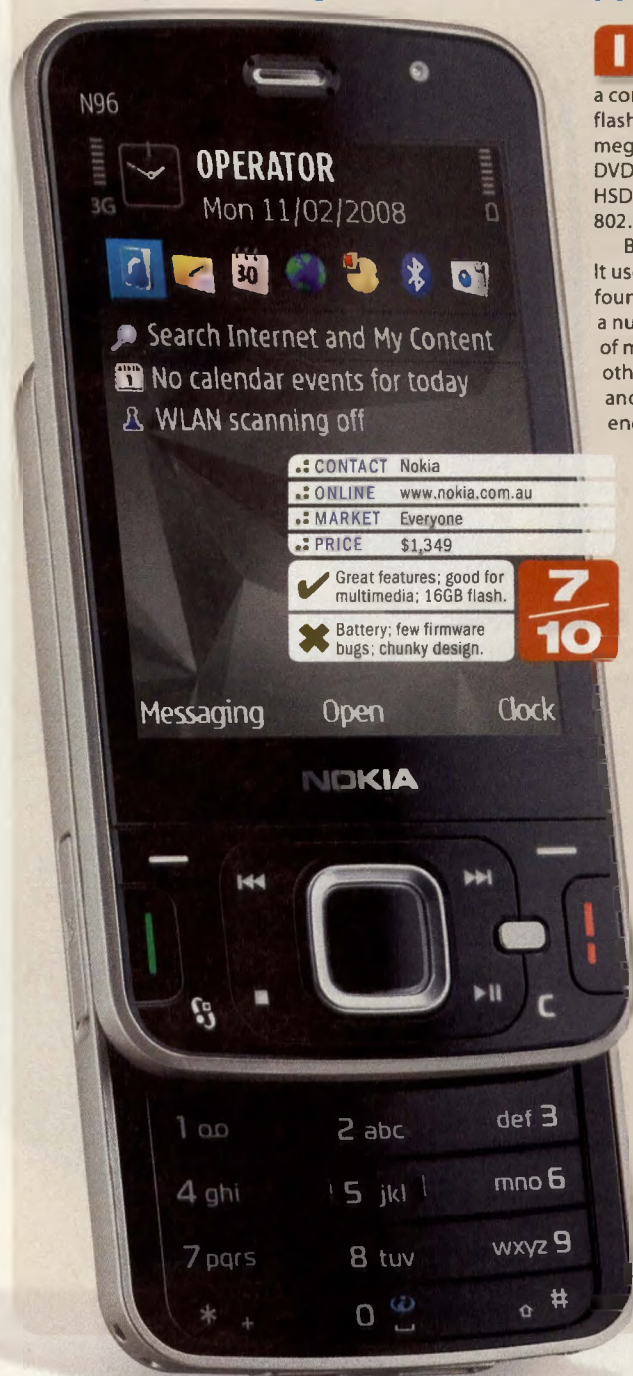
✗ Cramped keyboard;
poor web browser.

7
10

deceptively simple

Nokia N96

The N96 is one of the most eagerly anticipated smartphones of the year, but does it pack enough features and appeal to steal the limelight from the iPhone?



If it was purely a matter of features, the N96 would win by a comfortable margin. It's got a 16GB flash drive, microSDHC expansion, five-megapixel camera with Carl Zeiss optics and DVD-quality video recording, 3.6Mbit/s HSDPA, A-GPS, Bluetooth 2.0 + EDR and 802.11b/g WLAN.

But its main focus is on multimedia. It uses the same dual-slider design found on its predecessor, the N95, with a numeric keypad at one end and a set of media playback buttons at the other. The slide mechanism feels nice and solid, and the buttons at either end have excellent tactile feedback.

The stereo speakers pack a serious punch, but there's a lot of distortion at maximum volume.

Content can be accessed via separate applications like the Music Player, Photos and Real Player (for videos), but the Multimedia menu — launched via an unmarked button on the N96's face — makes it easier to browse through everything from a single interface. It also includes access to N-Gage (Nokia's mobile gaming platform), maps, internet bookmarks and RSS feeds, and contacts.

One feature that separates the N96 from other smartphones is the inclusion of a DVB-H receiver for access to digital TV broadcasts — the bad news is the requisite frequencies aren't supported in Australia. We can see this being a big source of confusion for users. As a consolation prize, Nokia has included a free voucher to download a season of one of four BBC Shows: *Walking with Dinosaurs*, *Little Britain*, *The Catherine Tate Show* and *Yes, Minister* — but the download link was still dead four days after the N96's release.

The N96 is competent at the

business end, but you have to work a little harder for this functionality. Exchange ActiveSync isn't available out of the box — you'll need to download the free Mail for Exchange program using the Download service. Similarly, the Quickoffice suite is for viewing Word, Excel and PowerPoint files only.

The N96 runs the Series 60 3rd Edition Feature Pack 2 operating system, and the up-side is that it's a standard icon-driven interface that's easy to pick up and use. But it's still hard to find what you're looking for, as many applications and settings aren't logically organised. Another source of confusion is the lack of consistency between the interfaces of each application.

The software version on our review unit was 10.065.098.1, and there are still a few bugs to be ironed out — it crashed a couple of times a day in our testing. We weren't able to get confirmation of the N96's processor type and speed before going to print, and, while it's generally responsive, there's a definite lag in certain applications. Pressing pause, for instance, takes a couple of seconds before the music player catches up.

Compared to many of the trendy smartphones currently on sale, the N96's plain appearance (essentially a facelift of the N95) is a let-down, but an even bigger disappointment is the N96's battery. With phones like the BlackBerry Bold and Palm Treo Pro boasting capacious batteries of 1400mAh and over, the N96's 950mAh battery is seriously lacking. The advertised run-time is underwhelming: 2.6 hours of talk time and 200 hours of standby time. Our first run of the N96 — which included 20 minutes of phone calls, 30 text messages and half-an-hour of web browsing — saw it lasting for 18 hours. This will get marginally better as the battery gets conditioned, but you'll still need to charge it at least once a day.



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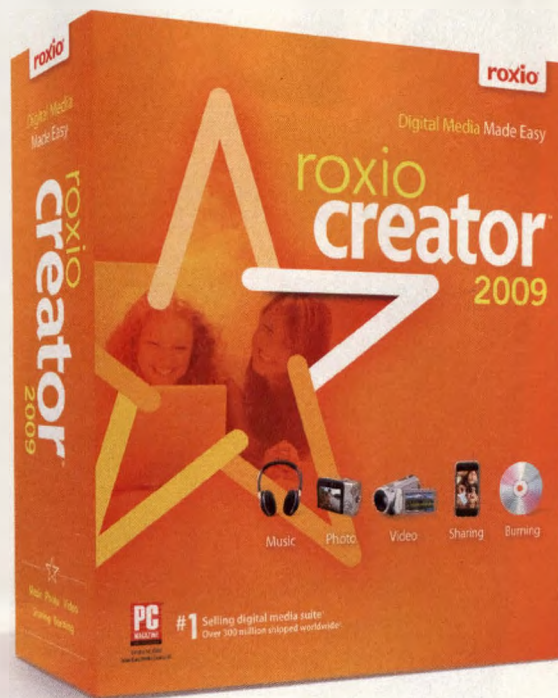
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HTC Touch Diamond

Naming a smartphone after one of the most sought-after gems in the world is a big call, and, unfortunately for HTC, it isn't perfect.



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ONLINE www.htc.com
MARKET Everyone
PRICE \$999

✓ High-res screen; flashy TouchFLO 3D interface.
✗ No memory cardslot; short battery life.

7
10

It's a bit clichéd to compare other smartphones to the iPhone, but in the HTC Touch Diamond's case, the similarity between the two makes it hard not to draw a comparison. The Touch Diamond offers most of the things the iPhone lacks, like multi-tasking, tethering and a replaceable battery, but it has its own flaws, too.

One of the first things that strikes you about the Touch Diamond is how small it is. Measuring 102 x 51 x 11.5mm and weighing a scant 110g, it's one of the most compact smartphones on the market. It's also one of the best-looking, with a sleek polished front and glossy black rear that features a diamond pattern of raised edges. Both sides are smudge magnets, though, and we found the front in particular gets scratched easily. A screen protector is included in the box, but we would've preferred a proper case for all-over protection.

Like the iPhone, the Touch Diamond impresses with its flashy TouchFLO 3D user interface. This lets you do a lot of tasks without leaving the Today screen (or taking out the stylus) like viewing upcoming appointments, calling people in your speed dial, playing music, reading messages and launching apps.

New email is presented in an actual envelope, pictures are shown as a stack of printed photos that float upwards as you're scrolling through them, and even the standard time display is rendered as a flip-style digital clock. These graphics would look stunning on any display, but on the Touch Diamond's screen they look even more so, as it has an unusually large 480 x 640 resolution — four times bigger than a standard smartphone.

HTC has added other enhancements to the Windows Mobile 6.1 Professional operating system, like a full QWERTY keyboard and an in-call screen with large buttons for turning on the speakerphone and other functions. But it's still Windows Mobile underneath, and if you

want to add new appointments, edit a Word document or change the Touch Diamond's ring tone, you're back at the decidedly less flashy standard interface.

Still, there are perks to having Windows Mobile as the back end. For all the complaints of it being slow and bloated, it's incredibly powerful. Third party applications number in the thousands, and software included with the operating system covers most of the bases for web browsing, email, multimedia, organisation and document creation. HTC also includes a few extras like Opera Mobile 9.5 and a YouTube client as well.

The Touch Diamond's main shortcoming is text entry. A handful of input options are available, but easiest to use is the full QWERTY keyboard, which presents buttons larger than Windows Mobile's standard software keyboard. It's still too small for extended text entry without a stylus, though, and we're not big fans of the predictive text software. Worse, it takes up over half the screen.

The Touch Diamond's 4GB of internal storage should be plenty for programs and files, but it's limiting for multimedia — especially as there's no memory card slot for adding more memory. Plus, the non-standard ExtUSB jack for connecting headphones means you'll have to purchase a separate adapter to use your own headphones or opt for a Bluetooth set.

The Diamond is powered by a 528MHz Qualcomm processor with a generous 192MB helping of RAM. Earlier versions of the Touch Diamond's firmware had serious lag issues, particularly with the TouchFLO 3D interface enabled, but we didn't encounter any performance drags on our review unit. More of a concern is its battery life; despite support for HSDPA and 802.11b/g WLAN — both of which can drain power at a rapid clip — it only has a small 900mAh battery, just enough to last you through a single day's use.

and the change agent

Apple iPhone 3G

It's sexy, feature-packed and incredibly easy to use, but contrary to popular opinion, the iPhone 3G isn't the messianic mobile it's made out to be.

The iPhone 3G is hugely popular, but it's far from a one-size-fits-all device. What it does well, it does amazingly well, but its shortcomings are equally profound. We'll start with what the iPhone is good at. A beautiful user interface makes tasks that used to be complex on a phone — like web browsing, email and multimedia playback — not only effortless but fun to do, making the iPhone a great choice for first-time smartphone users.

Apple has elevated touchscreen functionality to an art form, nixing the usual keypad, navigation controller and application buttons in favour of a huge 3.5-in touchscreen. Programs are launched by simply tapping on the relevant icons, and Apple's patented multi-touch technology means you can browse through music by flipping through album art with your finger, zoom in on text on a web site by double-tapping the relevant area, and scroll through contacts by dragging your finger up or down the screen. There's also a built-in accelerometer that automatically rotates the screen orientation to landscape in certain apps.

However, the lack of a physical keypad makes the iPhone a poor choice for writing lots of text. Apple has done some great things with the software keyboard on the iPhone — like aggressive error correction and keys that magnify when you press them — but it's no substitute for tactile buttons.

Aside from the killer user interface, the iPhone 3G does two things exceptionally well: web-browsing and multimedia. The Safari web browser is hands-down the best mobile browser in the business, letting you view web pages in their full desktop layout. Tabbed browsing and bookmarks are supported, and you can save any website as a 'webclip', which puts a shortcut in the iPhone's main menu. In our testing, Safari was able to render most complex sites flawlessly, but some sites would regularly crash the browser.

Given Apple's background in portable media players, it's no surprise that the iPhone is well-equipped for multimedia. There's 8GB or 16GB of storage on-board, depending on which model you get, and a gorgeous 320 x 480 resolution display makes for stunning video playback. As with the iPod, only MPEG-4 and H.264-encoded videos are supported. The addition of a standard 3.5mm jack means you can plug your own headphones in, but the in-built speaker needs more power.

The iPhone has the standard set of smartphone applications like email, calendar, notes and calculator, as well as cool extras like Google Maps and a dedicated YouTube client. It can also sync with Outlook or iCal on a desktop machine (using iTunes as the middle man) and Microsoft Exchange server over the air. One of the best additions to version 2.0 is the App Store, letting you install hundreds of great freeware and commercial applications directly from the built-in software, or sideloading it from iTunes on a computer.

Every flavour of wireless is catered for: quad-band GSM/EDGE, tri-band HSDPA, 802.11b/g WLAN, Bluetooth 2.0 + EDR and Assisted GPS, but there are limitations: you can't use the iPhone as a tethered modem for your laptop, the GPS is limited to use with Google Maps, which doesn't support voice guidance or true turn-by-turn navigation, and Bluetooth use is for headsets only — wireless file transfer and A2DP aren't supported.

The iPhone's other shortcomings are well-documented: no MMS, no video recording, no copy and paste and no memory card expansion. Multi-tasking isn't supported (although music can play in the background), the non-replaceable battery only lasts around a day, and there are issues with patchy 3G reception and lag with SMS and contacts that haven't been fixed in the last two firmware updates.



.. CONTACT Apple
.. ONLINE www.apple.com/au
.. MARKET Everyone
.. PRICE \$729

✓ Stunning design;
gorgeous interface.

✗ Reception issues; no
multi-tasking.

7
10

NETWORKING

GO BEYOND THE MANUAL

From improving your basic setup to implementing some pro-grade trickery, *Jon Thompson* reveals how to do amazing things with your network.





TIPS FROM THE PROS!



With hardware costs tumbling, broadband speeds increasing and software bulging with exciting possibilities, a wider range of networking technologies is available to the home user than ever before. What do you need to know before using them, and what tweaks and tricks can you use to get the most from your network? Can a Quality of Service-aware broadband router solve your VoIP telephony problems? Can you hold a successful LAN party using your existing network or must you invest in a high-speed one? From sharing your internet connection to discovering how to bypass your ISP's DNS servers, find out how to unleash the power of your network with our comprehensive masterclass.

Let's set the groundwork with some basics on networking hardware. The simplest way to connect your machines is to use an Ethernet hub. This simply broadcasts data across all its ports so that all machines receive all packets. You can also chain hubs together by plugging the link port from one into one of the data ports of another. Technically, hubs are known as Layer-1 switches, which is why you often see this label on hubs costing around \$20.

True switches are more complex. Layer-2 switches learn the underlying MAC address of each connected device and use this information to route data to specific ports rather than broadcasting across all of them. This method is more efficient and helps to keep documents secure by preventing people eavesdropping on unencrypted data meant for others.

Layer-3 switches are marked out by more sophisticated data switching functionality (including traffic prioritisation). They can talk to each other using special protocols that help decide the best route for each packet. Layer-4 switches include all of these features as well as network address translation and firewall capabilities. Domestic broadband routers are usually Layer-4 switches. At the top of the heap is the Layer-7 switch. These usually cost several thousand dollars and contain software to prioritise and route traffic based on application-specific criteria.

SHARING YOUR INTERNET CONNECTION

If you're still using a single Windows XP computer linked directly to your broadband modem, and you want to give a second computer access to the internet, you could upgrade to a dedicated broadband router. It may be cheaper, however, to use a network hub and simply activate Windows' Internet Connection Sharing (ICS) functionality.

When you originally installed your broadband drivers, the machine may have had ICS configured at the same time. On the Control Panel, double-click 'Network Connections'. The connection will say 'Shared' if ICS is configured. If so, there's nothing more to do. Plug in the second machine, boot it up and open a browser.

To configure ICS, double-click on the broadband connection to access its status. Click on the resulting 'Properties' button and click the Advanced tab. Click the tick box marked 'Allow other network users to connect through this computer's Internet connection', press 'OK' and reboot your new machine. The new machine will be served an IP address from the gateway automatically when it boots up, because ICS has also turned the PC into a DHCP server.



FACTFILE

Networks always have a 'default gateway'. This is a computer or router through which all connections to non-local IP addresses pass. It sends them to the next machine in the chain that in turn knows how to get one step – or 'hop' – closer to the target server.

Chaining together two Ethernet hubs adds to your network capacity.



VOICE OVER IP

For Voice over IP (VoIP), all you really need is a set of speakers and a microphone — even the basic ones included with a laptop should do, so there's no need to purchase a handset or headset to get started. Most VoIP software is also free. Download Skype (www.skype.com) and you can be making calls in minutes.

PC-to-PC VoIP calls are usually free. As long as the person you want to call is registered with the same service, simply find their username in the directory and call them. VoIP providers usually charge you to place a VoIP call to a landline, however. The service will detect that you're calling a home phone and will connect you to its public switched telephone network (PSTN) exchange.

Before embracing VoIP, it pays to understand the drawbacks. If the power fails, for example, you'll be left without a phone until you plug your landline back in. The sound quality depends on your connection speed. If you're calling a dial-up computer from broadband, don't expect CD-quality sound.

Instead of using the reliable but traffic-heavy TCP protocol to make calls, VoIP uses the less reliable but more lightweight UDP, which can't tell if packets are getting lost. This can lead to 'stuttering', where the signal drops out or becomes garbled. To help overcome stuttering, you'll need a broadband router that supports QoS (Quality

of Service). Use this to set VoIP packets to a higher priority than other traffic. This should make conversations as stutter-free as possible.

MANAGING MOBILE FILES

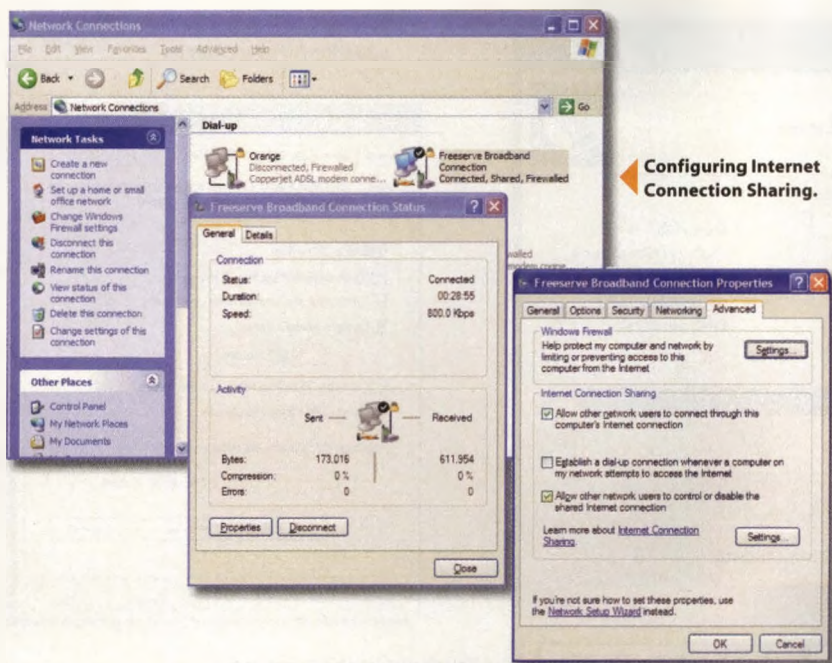
When you've been on the move with your laptop, rejoining your home network can be a hassle. The biggest problem for most people is the files that they work on while away from home. Some copy the edited versions of files back to their servers by hand, or store them on easily lost USB sticks. However, XP provides a much better solution: file synchronisation.

On your laptop, go to the Control Panel and select 'User Accounts'. Select the option 'Change the way users log on and off' and deselect 'Use Fast User Switching'. This will enable file synchronisation. Apply changes and close the Control Panel. Now open My Documents and select 'Folder Options' on the Tools menu. Click on the 'Offline File' tab and select the 'Enable Offline Files' tick box.

Still on your laptop, browse to a shared file or folder on your server that you want to make available when you're away from home. Right-click on it and select 'Make Available Offline'. When you do this for the first time, a wizard will ask you if you want to synchronise files automatically when you log on or off, whether you want Windows to remind you that you're working offline, and if you want Windows to create a desktop icon for the offline copies.

When you return to your home network and power up the laptop, Windows will automatically copy the files that you've worked on back to the server, ensuring that you always use up-to-date versions.

◀ If you download Skype you can be making free calls — including video calls — in minutes.



Configuring Internet Connection Sharing.

GAME ON

If you're playing interactive games against strangers over the internet, you'll need all the bandwidth your broadband connection can provide. You may have an 8Mbit/s connection, but this is download speed. The upload speed will be far lower. While you can't do anything about delays once your traffic is out on the net, you can certainly prevent local applications impeding it.

Before you begin an online gaming session, stop running all applications that could conceivably hog your broadband connection (or your CPU and RAM). This includes torrent clients (especially files that you're seeding to others), your email program and instant messaging and VoIP services. If your router supports it, enable QoS and prioritise data sent from your game. The router manual will tell you which port number to prioritise. See the 'Quality of Service' box for more details of exactly what QoS can do for you.

LAN-based gaming with friends is great fun, and informal LAN parties can grow spontaneously to become regular events. LAN

games generate plenty of traffic, so it pays to ensure that the machines have a dedicated hub (or chain of hubs) to themselves. Many people incorrectly believe that you need a powerful LAN switch for gaming, but this isn't so. You will, however, need as many ports as there are players — so if you expect people to bring their own machines, either buy an extra cheap hub or two, or get them to bring some extra networking hardware along.

On the subject of people bringing their own machines, one regular LAN gamer pointed out that you should ensure there are one or two spare four-way mains extension leads handy, just in case. Remember too that some laptops may have come from wireless-only LANs. If you don't have wireless capability, ensure that you have extra LAN cables so that they can plug in to the network, or that they bring their own.

SHARING WINDOWS PRINTERS

If you have one printer and several computers, transferring data and having someone else print

TEST YOUR CONNECTIVITY

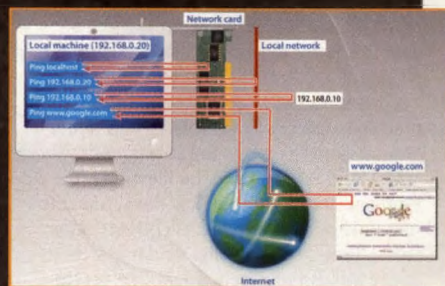
HOW THE PROFESSIONALS TEST FOR CONNECTIVITY PROBLEMS

Professional network administrators use a simple procedure for testing network connectivity that can quickly pinpoint problems. It begins by finding the network card's IP address. In Windows, open a command line and enter 'ipconfig', and in Linux, run 'ifconfig' as root.

Next, enter the command 'ping localhost'. This works in both Linux and Windows and is called a local loopback test. Localhost is a special machine name that maps onto the equally special IP address 127.0.0.1. This ping traffic never reaches the network. Instead, when you send traffic to localhost, the network card detects that the address is local and responds itself — thus proving that the network card is functioning.

Now ping the IP address of the network card that you discovered using ipconfig above. This is the remote loopback test. It proves that the network card is listening for traffic on the network by picking up the packets with its IP address attached.

Next, ping the other machines on the network and finally, a web site such as www.google.com.au. If this final ping works, you're in business. If not, then you know where the problem lies.



This diagram shows the sequence of loopbacks used to test connectivity on a network.

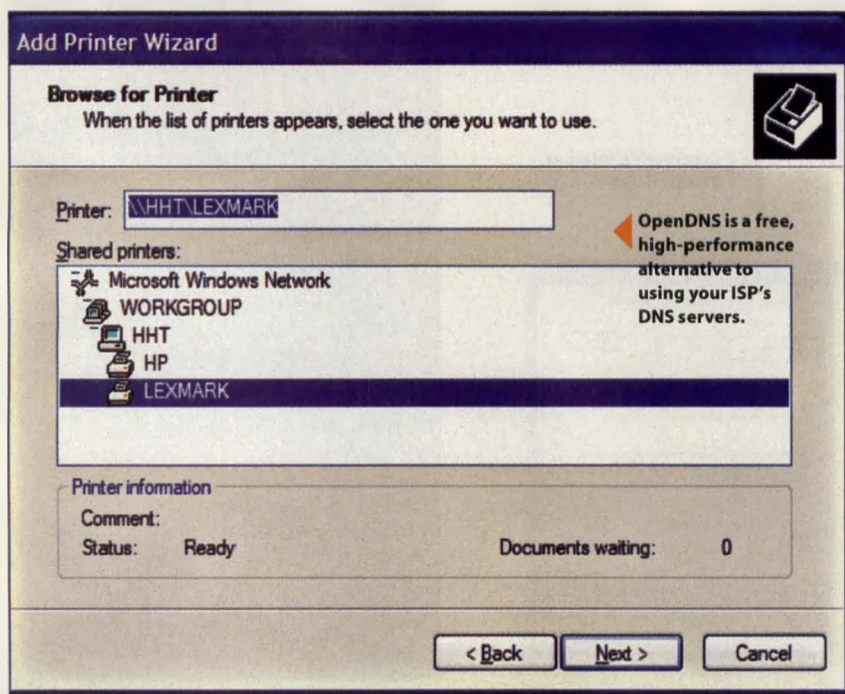


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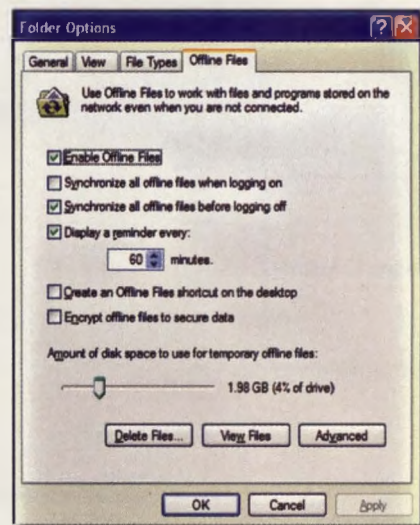
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XP's file synchronisation feature makes updating files very simple.



You should be able to see and connect to any printer that you want.

it out at their convenience can be a pain. Sharing the printer means that anyone on your network can use it as if it were local to their own machine.

On the machine to which the printer is attached, log on as an Administrator, access the Control Panel and select 'Printers and Faxes'. On the subsequent window, right-click on your printer and select 'Sharing...'. In the Sharing tab of the Printer Properties window that appears, click the 'Share this printer' radio button and give it a name.

To connect to the printer from another machine, open its Control Panel and select 'Printers and Faxes'. On the subsequent window, select 'Add Printer' from the file menu. The Add Printer wizard appears. Click 'Next', select the networked printer option, click 'Next' again, select 'Browse for a printer' and press 'Next' again. Browse your network and select the printer. Press 'Next' again and press 'Yes' on the subsequent pop-up that warns of drivers carrying viruses. Windows will now install the driver for your printer.

MEDIA SHARING TIPS

You don't need a super-fast processor or dedicated NAS hardware to share media between computers, making it a suitable job for older systems.

If several people access different files simultaneously, a lack of memory can become a bottleneck, so it's a good idea to install extra RAM. If you know that your server will be busy serving multiple files, it's also a good idea to buy a second disk to store your data. You'll get better performance because the second disk's read/write heads aren't serving two masters at once.

When the hardware is as you want it, perform

a clean installation of the operating system. If you use Windows on a single-disk system, clear extra disk space by going to the Control Panel, selecting 'Add or Remove Programs' and selecting 'Add Remove Windows Components'. Remove everything you don't need — like Outlook Express.

LINUX ACCESSIBILITY

Linux is moving into the mainstream through machines like the ASUS Eee. It makes an excellent alternative operating system for media servers. Here's how to access Windows shares from Linux and Linux file systems from Windows.

Let's first examine mounting Windows shares in Linux using the new Ubuntu version 8.04, which has the Samba SMB software installed by default.

Simply go to the desktop's System menu, click on 'Places' and select 'Network' from the pull-down menu. If no other machines show up in the subsequent window, click the 'Reload' button. Ubuntu will probe the local network for other computers. If any have shared folders, you can click on the machines to see them.

Sharing folders from Ubuntu is as simple as doing so in Windows. Open a command line and enter the command 'sudo nautilus'. After entering your root password, the File Manager appears. If you only set up a user account at installation, this is the password to use.

Right-click on the folder you want to share and select 'Sharing Options'.

The sharing window pops up. Press the tick box marked 'Share this folder' and if Samba isn't installed, you'll be prompted to install it. As long as you have an open internet connection, Ubuntu will download and install the latest version for

you after you enter your password.

Once Samba is installed, you can change the options on the sharing window. The default option is to share the folder with read-only properties. You can grant guest access to the share by having any remote users supply a username of 'guest' without a password. Finally, press the 'Create Share' button and Ubuntu should do the rest. If you go to the 'Network' option on the Desktop's 'Places' menu, you should see your Linux machine. Click on it and you should see the shared folder.

On Windows XP, go to My Network Places and click 'Add Network Place' to start the wizard. Click 'Next' and 'Next' again, then enter the path to the shared Linux folder in the form: '\\<machine>\<share>', where <machine> is the name of the Linux machine and <share> is the name of the folder.

Hit Enter and enter a local name for the share. When you finish the wizard, Windows will attempt to open the share. If you're asked for a username and password, enter the name of the account that you use in Linux. The contents of the shared folder should appear.

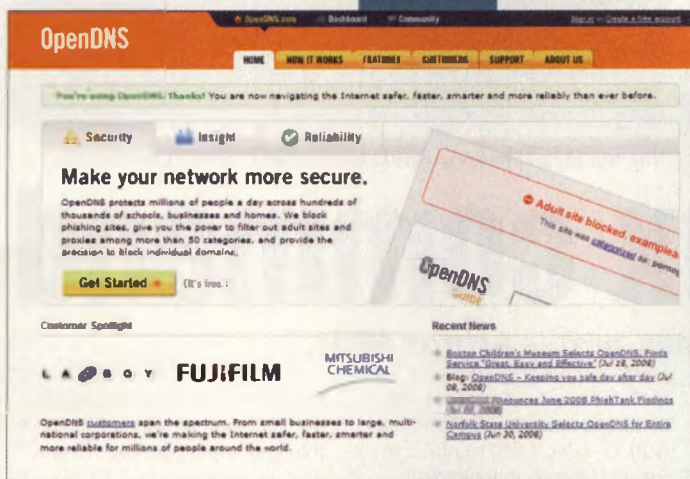
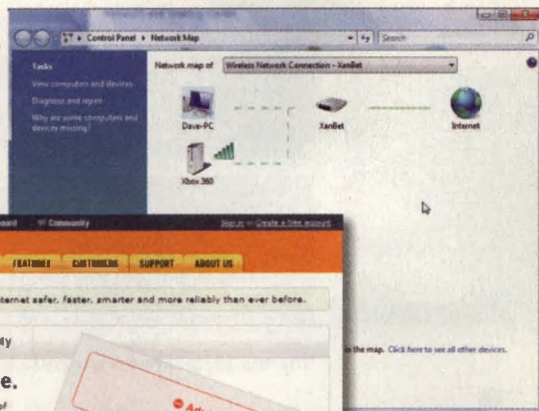
VISTA NETWORK DISCOVERY

You can make Windows Vista map your network for you. Go to the Control Panel and select 'Network and Internet'. The view changes to the Network and Sharing Centre.

If network discovery is turned off, the graphical view of the network at the top of the window will show practically nothing.

To turn on network discovery, scroll down to the section named 'Sharing and Discovery' and expand it. You'll see options to turn network discovery on and off again. Switch it on, then at

Vista can draw a map of your network that includes all of your Windows machines.



OpenDNS is a free, high-performance alternative to using your ISP's DNS servers.

the top of the window click 'View Full Map'. Vista will attempt to uncover the machines it can see from its LAN card — including your broadband gateway. Click on a machine and you should be able to see the printers and folders it shares.

If you only use Vista machines on your network, the operating system can also draw a topographical map of how everything (including your Xbox 360) fits together using the Link-layer Topology Discovery (LLTD) protocol. You can download LLTD software from Microsoft that enables XP machines to be included here: www.tinyurl.com/ynrkqf.

SPEEDIER DNS

Whenever you click on a link or enter a URL into your browser's address bar, your computer calls your ISP's DNS servers so that it can make the conversion from domain name to IP address. However, these DNS servers can become heavily loaded at peak times, which often causes timeouts. Luckily, you can bypass this problem completely through the use of one of the free, high-performance DNS services that are available. One such service is OpenDNS (www.opendns.com). The IP addresses of its servers are 208.67.222.22 and 208.67.220.220.

FACTFILE

There's a good chance that the manuals for your networking equipment will describe useful extra functionality — especially how to upgrade the onboard firmware. Your hardware is the public face of your network, so it pays to ensure that it stays as up to date as possible.

In Windows XP, open the Control Panel, select 'Network Connections' and then select the active broadband connection. Hit the 'Properties' button and then the Networking tab. Select the 'Internet Protocol (TCP/IP)' entry and hit the 'Properties' button again. Select 'Use the following DNS server addresses' and enter the IP addresses of the two third-party servers.

In Vista, go to the Control Panel and select 'Network and Internet', then click on 'Network and Sharing Centre' and select 'Manage Network Connections' on the left-hand side of the window. Select the active network connection, select 'Properties' and double-click on the option 'Internet Protocol Version 4 (TCP/IPv4)'. Finally, enter the IP addresses of the DNS servers.

In Ubuntu, select 'Network' from the Administration menu on the Configuration desktop menu. Press 'Unlock' on the resulting window, enter the root password and select the DNS tab. Delete the original entry and add the new DNS servers instead.

You can also reduce the time that it takes to visit your regular, bookmarked haunts on the web simply by calling a web site using its IP address in place of its domain name (typing <http://74.125.19.103> instead of www.google.com, for example). This is faster, as it completely removes the need for a DNS server to make the conversion of domain name to IP address.

To find the IP address of a target server, simply open a command line (in Linux, open your favourite shell) and type the ping command followed by the domain name (for example, 'ping www.google.com'). The IP address will be returned. Make sure that you enter the IP address correctly, though, or you might surf to somewhere you'd rather not be. **ITC**

QUALITY OF SERVICE

HOW QUALITY OF SERVICE BITS SMOOTH DATA FLOW

Quality of Service (QoS) is a term used by router manufacturers to describe a complex algorithm that prioritises traffic depending on the ports that are used. However, what does it mean, and what can it do for you?

In the headers of all packets travelling across the internet are several QoS bits that can be set to provide a priority for the packet. The idea is that when a QoS-aware router handles these packets, it prioritises those that have higher priority and sends them on first. By using a broadband router that can set QoS bits for gaming, VoIP and IPTV protocols, you should get better service.

These days, even very cheap broadband routers often feature QoS capability. Consult your manual to find out if yours does. If so, you can improve response times in network-based games and interactive services such as VoIP.

Some ISPs and large routers out on the internet reset these bits to prevent problems associated with queuing large amounts of low-priority traffic, but as long as you can at least prioritise the traffic leaving your network, you should get better response times.



Even low-cost broadband routers like the Linksys Wireless-G now have Quality of Service functionality.


```
martigen@ubuntu:/$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/md0        20G   15G   4.5G   77% /
varrun          2.0G   208K   2.0G    1% /var/run
varlock         2.0G    0   2.0G    0% /var/lock
udev            2.0G   132K   2.0G    1% /dev
devshm          2.0G    12K   2.0G    1% /dev/shm
/dev/sda2       494M   73M   396M   16% /boot
gvfs-fuse-daemon 20G   15G   4.5G   77% /home/martigen/.gvfs
/dev/scd0        6.1G   6.1G    0 100% /media/cdrom0
/dev/sda6        13G    11G   1.9G   85% /media/Swap
martigen@ubuntu:/$
```

The output of the disk-free command.

```
martigen@ubuntu:/$ top
top - 00:30:46 up 5:29, 4 users, load average: 0.12, 0.07, 0.02
Tasks: 115 total, 2 running, 113 sleeping, 0 stopped, 0 zombie
Cpu(s): 37.1%us, 1.0%sy, 0.0%ni, 61.6%id, 0.0%wa, 0.2%hi, 0.2%si, 0.0%st
Mem: 4040452k total, 2244640k used, 1795812k free, 54884k buffers
Swap: 2096448k total, 0k used, 2096448k free, 1/19252k cached

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM     time+  COMMAND
 8568 martigen 20   0 567m 115m 17m  S   3.2   2.9   1:03.58 deluge
 8456 martigen 20   0 127m 10m 8144  S   1.0   0.3   0:02.89 metacity
 5000 martigen 20   0 43688 5/24 2896  S   0.1   0.1   0:01.10 gconfd.2
 8345 martigen 20   0 248m 11m 8864  S   0.3   0.3   0:00.24 gnome-settings-
 8458 martigen 20   0 338m 39m 15m  S   0.1   0.1   0:03.71 gnome-panel
 8467 martigen 20   0 131m 2724 1348  S   0.1   0.1   0:00.64 gnome-screensav
 8514 martigen 20   0 188m 16m 8848  S   0.4   0.4   0:00.04 python
    1 root      0   0 4192 832 832  S   0.0   0.0   0:00.26 init
```

The 'top' program makes it easy to see processes from the command line.

At your Linux command

Everybody needs to take control sometimes, writes *Ashton Mills*.

Because Linux is Linux, and the command line really is an infinitely powerful tool, you will invariably come to use it at some stage, even if only for a few simple commands. And that's fine.

Ubuntu is all about making Linux easier to use and not needing to go 'old-school' and jump to a command line — but for the times when you might need to, we're going to dedicate this article to a primer so you can feel confident about using it when you need to.

And, who knows, you may even discover a level of power and functionality you didn't know existed under the hood of Ubuntu!

WHY THE COMMAND LINE?

Given the slick interface, why would you want to use the command line at all? There are a number of reasons, but the three you are most likely to encounter are:

- Faster speed
- More control
- System maintenance

The latter you can relate to being a bit like Windows' Safe Mode, in that there are certain tools you can run to repair systems, and these are done from the command line. Usually if you need to do this, you're following some instructions to do so, and it's pretty straightforward.

The second is simply because most of the administrator level tasks are accomplished with specialised commands which have no, or limited, alternatives in the GUI.

And the first you might be surprised by: faster? Yes, indeed. For example — rather than loading Synaptic and drilling away through the menus to remove unnecessary packages, you could do this from the command line much faster. You might as well try this now, as it's safe and will free up some disk space for you. Click Applications > Accessories > Terminal and enter the following two commands:

```
sudo apt-get autoremove
sudo apt-get clean
```

The first command will remove any packages on your system that are no longer required, while the second will remove any downloaded and cached '.deb' files (for which there will be one for every update or new program you've installed). And what do the actual commands mean? Glad you asked. I'll cover this below, but first it helps to understand the nature of the command line.

TERMINALS 101

When you open up a command line you really are looking under the hood of your system. The GUI you use every day is an application, just like a browser or word processor, running on top of the Linux system for which the primary interface is the command line, or 'terminal'. And it's always there.

If you press Alt-F1 you'll be presented with a full-screen terminal login to your system. This

is what you would see if you ran Linux headless (that is, without a GUI). Pressing Alt-F1 to Alt-F6 you'll see you have six independent terminals to use. And how do you get back to the graphical interface? That's running on terminal seven, so hit Alt-F7. Knowing these terminals are here is handy if you ever run into problems with the GUI and need to kill programs.

The command line follows a number of rules that are helpful to know:

It's case-sensitive: a directory called 'APC' is not the same as one called 'apc'.

It has a command history: use the up arrow key to see previous commands.

It can complete your commands: if you're not sure of the full name of a program, enter some letters and press TAB. Press it again to get an expanded list.

It can terminate a command: pressing Ctrl+C will end the command in process.

Silence is golden: most commands, if they are successful, report nothing unless they are supposed to (like listing a directory). If you see a response, it's usually an error.

And, finally, when you're ready to leave a terminal, type 'exit'. There are other fundamental operations,

like pipes ('|', for directing output from one program to another), but this is enough to get you started.

COMMON COMMANDS

If you're old enough to have used DOS, you'll remember there are basic commands to navigate and interact with files. Linux is the same, and these commands will let you manipulate the file system:

ls — list directory contents, can be run with **ls -la** ('list' mode, and 'all' files) to show a detailed listing.

cd — change directory, eg. **cd /tmp**. Used on its own will take you to your home directory.

cp — copy files and directories, eg. **cp work.txt /home/apc**.

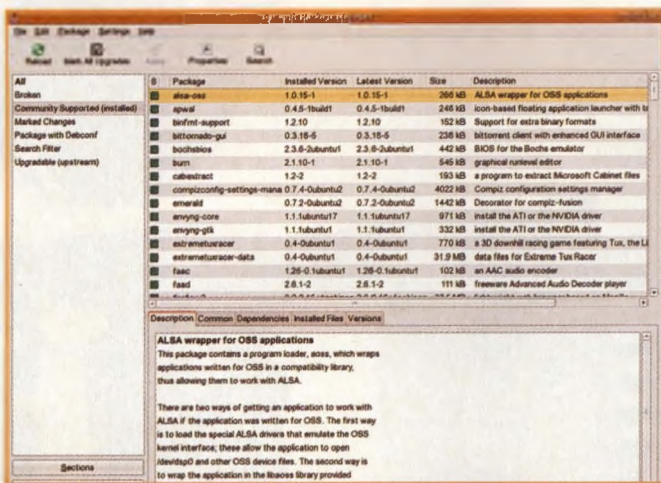
mv — move files or directories, same notation as **cp**, also used to rename.

rm — remove files or directories, eg. **rm work.txt**.

mkdir — make a new directory; use **rmdir** to remove an empty directory.

cat — view files, eg. **cat work.txt**. Be sure to only use on non-binary files.

All of these commands have numerous switches to change their behaviour, and you can learn these by reading their manuals — which leads us to some useful commands that are handy to know for your



Sometimes it's quicker to use 'apt-get' than Synaptic to install packages.

Ubuntu system:

man – brings up the manual for any command. For example, **man cp**. Scroll with page up/down and cursor keys. Press 'q' to exit.

sudo – execute a command as another user, defaults to root (administrator).

Use **sudo -s** to login as the root user and run commands without using **sudo**, but see 'The power of root' on the right.

passwd – change the password of the current account, or the specified user.

top – displays a real-time process list of running programs. Press '1' to show load on multi-core CPUs, 'h' for help and 'q' to exit.

ps – like **ls** but for processes. Use **ps ax** to show all processes on a system, and not just your own.

kill – kill a process. Requires the process id (PID) which can be found in **top** or with **ps**.

Alternatively, use **kill** followed by the process name. Use **kill -9** for particularly stubborn programs.

df – disk-free, use **df -h** for a 'human readable' format (displays in unit measurements).

nano – basic text editor that works like Notepad. Press Ctrl+X to exit and save a file.

apt-get – allows you to install or remove programs from Ubuntu's repositories. It has many options, run **man apt-get** to see them.

reboot – reboots the computer! Requires root access (so use with **sudo**).

shutdown – shuts down the computer! As above, but accepts a delay.

shutdown -h now – to shut down the machine immediately.

This is, as you can imagine, only a small sample of some of the commands available, but they are the ones you are most likely to need.

For example, if you had a serious crash and X froze you could Alt-F1 to a terminal, log in, and then either execute **sudo reboot** to reboot your system, or just try killing X with **sudo pkill X** (note, however, there's an easier way to do this – see 'Restarting X' at right).

If you browse the Ubuntu forums you will likely see other commands used in solutions to particular problems, like installing a new program with 'apt-get', which is actually the underlying source for GUI-based programs like the Add/Remove dialog and the Synaptic package manager.

Next month we'll cover a few more command-line basics and look into networking your Ubuntu box with Windows machines. **ETC**

THE POWER OF ROOT

Be careful when using the 'sudo' command, especially if you log in as the root user to run commands. As the root user you have full access to the system, and a bad command (like using the 'rm' command in the wrong place) could lead to data loss – which is why you don't get logged into your user account by default! It's just like being administrator in Windows, so treat it with care.

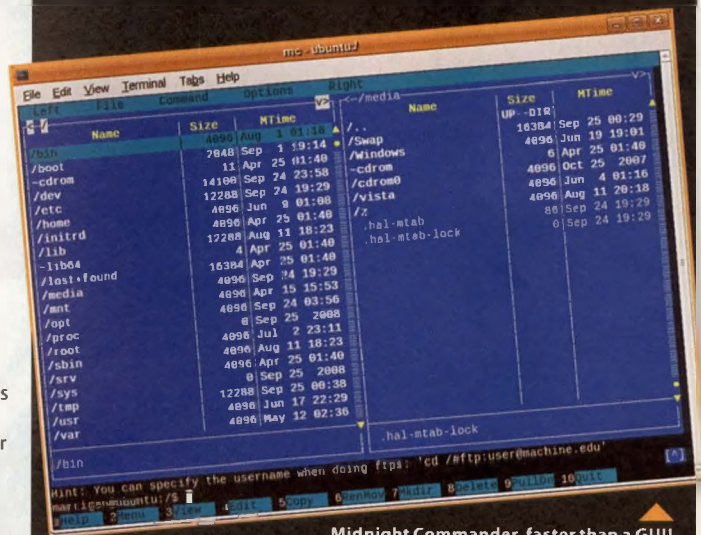
RESTARTING X

The three-finger salute from Windows doesn't work in Linux (and there are other ways to bring up the process list depending on the desktop), but the X Window system does have its own three-finger salute – Ctrl-Alt-Backspace. Pressing this combination will kill X instantly – and thus your desktop and currently-running applications – so save it for emergencies.

MIDNIGHT COMMANDER

If you intend to spend a lot of time managing files from the command line, Midnight Commander is an essential tool. It works similarly to the classic XTreeGold from DOS and can sometimes be quicker for copying and moving large numbers of files than the Nautilus file manager. It can also view inside compressed files, browse inside ISO images, and even connect to remote ftp or Windows network shares.

To install Midnight Commander run 'apt-get install mc' and launch it with 'mc'. You can navigate your file system with the cursor keys, and use the function keys to perform tasks like copying, viewing, editing and deleting. If you run it in a terminal on your desktop, you can also use the mouse to click on the menus.



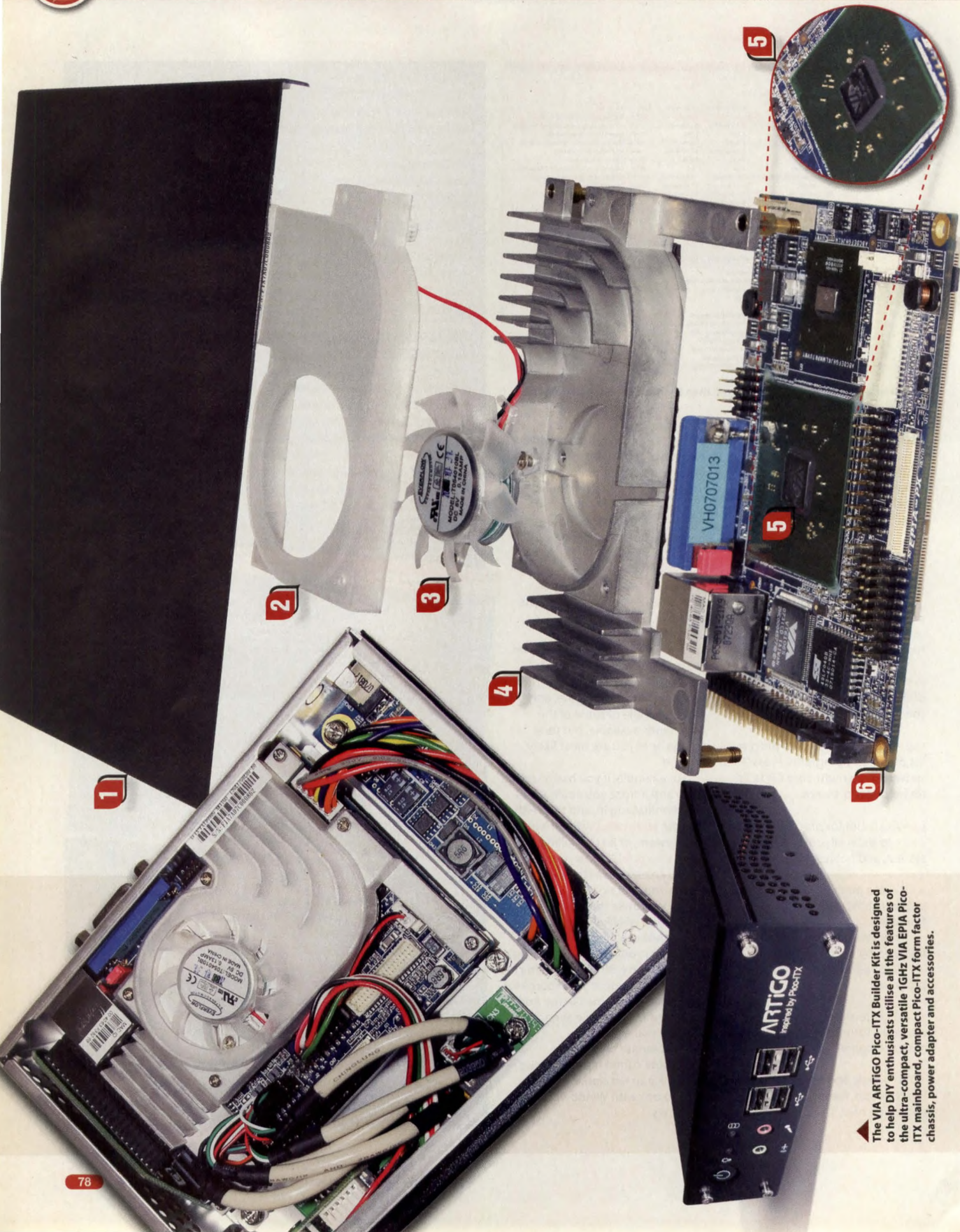
Midnight Commander, faster than a GUI!

USE THE WINDOWS KEY IN UBUNTU

That (sometimes annoying) Windows key – also called the Super key – on your keyboard doesn't, understandably, do anything in Ubuntu. However, it can if you want it to – for example, to bring up the Applications menu similarly to how it brings up the Start menu under Windows. To do this:

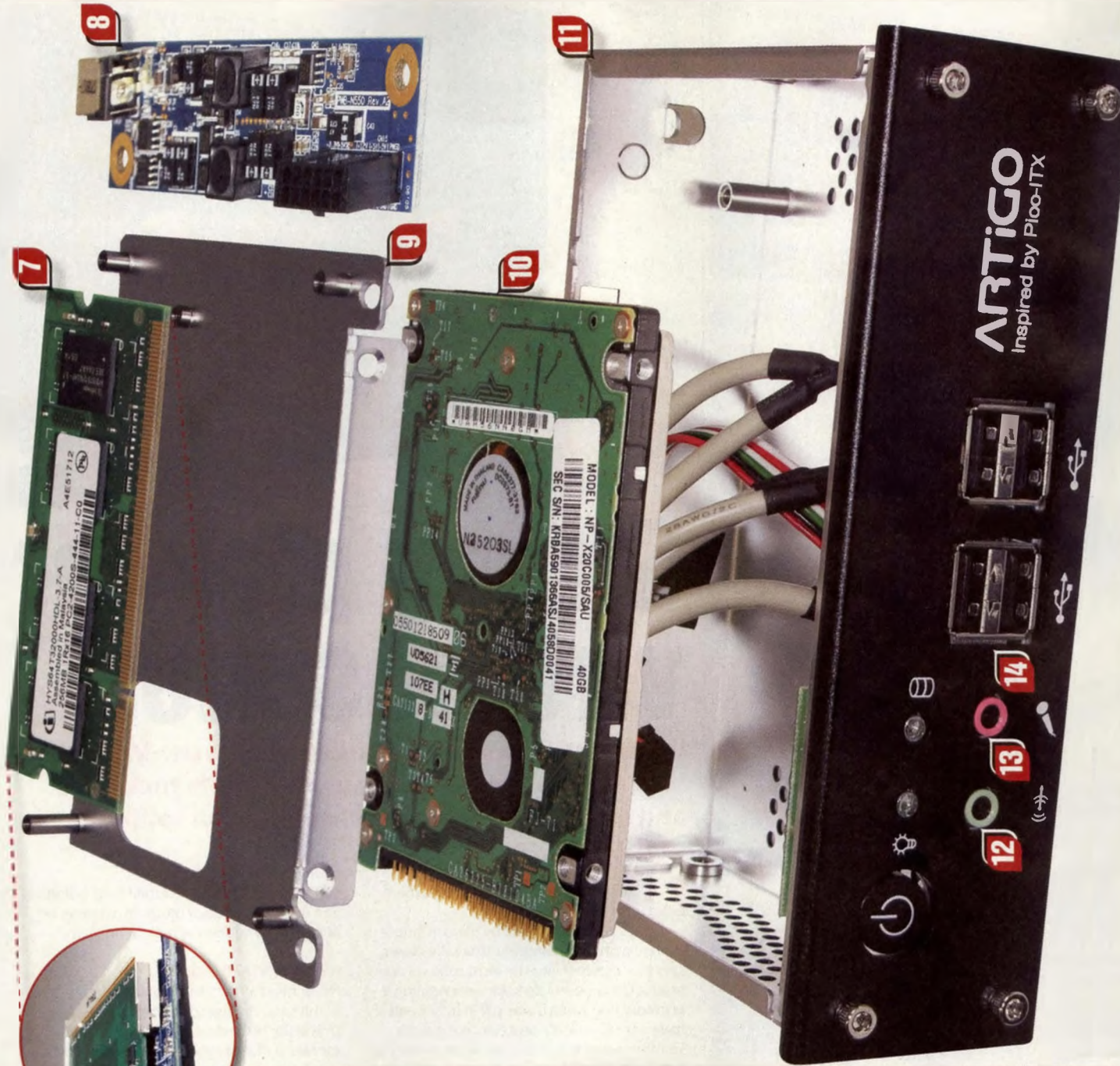
- Click System > Preferences > Keyboard Shortcuts.
- Scroll down to 'Show the panel menu'.
- Click to assign a new shortcut.
- Tap the Windows key.

Now the Windows key will open up Applications, and you can also scroll to the other menus using the arrow keys.



The VIA ARTiGO Pico-ITX Builder Kit is designed to help DIY enthusiasts utilise all the features of the ultra-compact, versatile 1GHz VIA EPIA Pico-ITX mainboard, compact Pico-ITX form factor chassis, power adapter and accessories.

This month, we explode VIA's amazingly small ARTiGO Pico-ITX PC to see just what you get in so small a package.



- 1** Chassis top cover: the entire chassis can fit in a 5.25in hard disk drive bay.
- 2** Heatsink air shroud: this keeps air directed over the heat sink fins for optimal cooling.
- 3** Cooling fan: apart from the hard disk drive, the only moving part in the PC.
- 4** Heatsink: this moves heat away from the hot components.
- 5** VIA C7 1GHz processor: the heart of the EPIA Pico-ITX platform.
- 6** Pico-ITX Mainboard: this tiny motherboard has a surprising amount of functionality in a small space.
- 7** RAM: a DDR SO-DIMM is required for running the Artigo kit.
- 8** PSU: this extremely small PSU works with an external power adaptor.
- 9** Aluminium plate: for mounting the motherboard and hard disk drive.
- 10** Hard disk drive: a 9.5mm 2.5in hard disk drive for internal storage.
- 11** Artigo Chassis: a 5.25in mountable chassis included in the kit.
- 12** 3.5mm audio out: for audio output from the system.
- 13** 2.5mm microphone: for attaching a microphone to the system.
- 14** USB 2.0 ports: four ports for adding keyboard, mouse, optical drive etc.

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Microsoft



apc insight

virtualisation

**Part 2
OF FOUR**



Strong play for virtualisation

It was late to enter the market with Hyper-V, but Microsoft is winning plaudits for its rock-solid and relatively affordable virtualisation solution, says David Braue.

Here's a little quiz. What vendor is this user referring to?

"It has been developed by them in-house from scratch to fit a need, and it really shows," says the customer. "It's the most solid version 1 product I have ever used. We were running it in production when it was still in beta 3 and have not had a single problem, not a single stumbling block. Even if I had all the money in the world, I would not buy [the competitors' products]. It has impressed me that much."

Yes, it's Microsoft. The quote comes from Tom Townsend, Windows systems team leader within the Information and Communications Technology division of the University of Canberra. He's referring to Hyper-V, the new virtualisation technology from Microsoft — a company that is not generally known for rock-solid version 1 products (so much so that companies regularly hold off upgrades until the first service pack is released).

Even Microsoft readily admits its new-product hoodoo: "We're well aware that Hyper-V is a version 1 product and, especially in the market space we're going after, that version 1

software has a stigma attached to it," admits Ben Armstrong, senior program manager on Microsoft's Windows virtualisation team.

HYPER-V, HYPERSPEED

Never mind all that: throughout the course of this year, Townsend has helped steer the University of Canberra away from an ageing morass of old servers to a far more consolidated data centre built around Microsoft's Windows Server 2008 (W2K8) technology. The target: the university's base of more than 200 physical servers, around half of which were running Windows Server 2003 and half running Linux or Sun Solaris.

Over the past few months, Townsend's team has successfully used the company's Hyper-V virtualisation platform to reduce the number of physical servers significantly. What used to be 36 separate servers, each with its own application, is now handled by two physical servers, each running about 18 virtual machines (VMs) managed by Hyper-V. And this includes not only network services but mission-critical applications like the university's entire web site

Who makes sure 18,000 Continental Airlines crew members are ready for takeoff?





and multimedia search engine.

The most immediate benefit to the university has been substantially reduced costs, both from lower hardware maintenance and capital expenditure, and from software licensing: "We're saving on licensing, and spending far less on Microsoft products than we were before moving to Hyper-V," says Townsend. "We're a university and had to be fairly strict with our budgets; we paid more for the Data Center version of Windows 2008 Server but saved thousands and thousands on licensing on top of that."

The team is also saving considerable time with the technology, which removes the agony of waiting for new server purchases to be approved before testing new applications.

"The technology is incredibly powerful and really has sped up our testing and development," Townsend explains. "Developers can build and develop their applications down one path, then if they decide it's the wrong path they can go back to the root and start a new tree [with a new virtual machine]. No longer do they have to beg for hardware and wait weeks for it to be delivered and set up; that's a long, laborious and unnecessary task to go through."

That Hyper-V is drawing such rave reviews is testament not only to the technical competence of Microsoft's server team but to the sheer importance with which Microsoft views the server virtualisation market.

Although Microsoft has previously offered a severely limited virtualisation platform, Virtual Server 2005, Hyper-V takes such a different technological direction that it is for all intents and purposes a new product. Several years in the making, Hyper-V is nothing less than the linchpin of Microsoft's

long-term data centre strategy.

KEEPING WINDOWS IN CONTROL

The difference between the 64-bit Hyper-V and 32-bit Virtual Server 2005 is more than just a question of bits: in development concurrently with the well-received W2K8, Hyper-V has been designed not as an operating system add-on like Virtual Server 2005 but as a fundamental component of the new environment that is intimately tied with the operating system.

This gives the hypervisor the equivalent of a back-stage pass in the data centre, allowing it to reach down to the very core of the operating system and assert itself when necessary in the ongoing, epic battle for limited system resources.

The most immediate difference lies in the performance of the new environment, which has enabled a much higher level of virtualisation at software-as-a-service provider eMantra.

eMantra hosts business applications for customers who access them over the internet, and is shifting its customers' environments from individual physical servers to virtual servers that are improving performance and reducing costs all around.

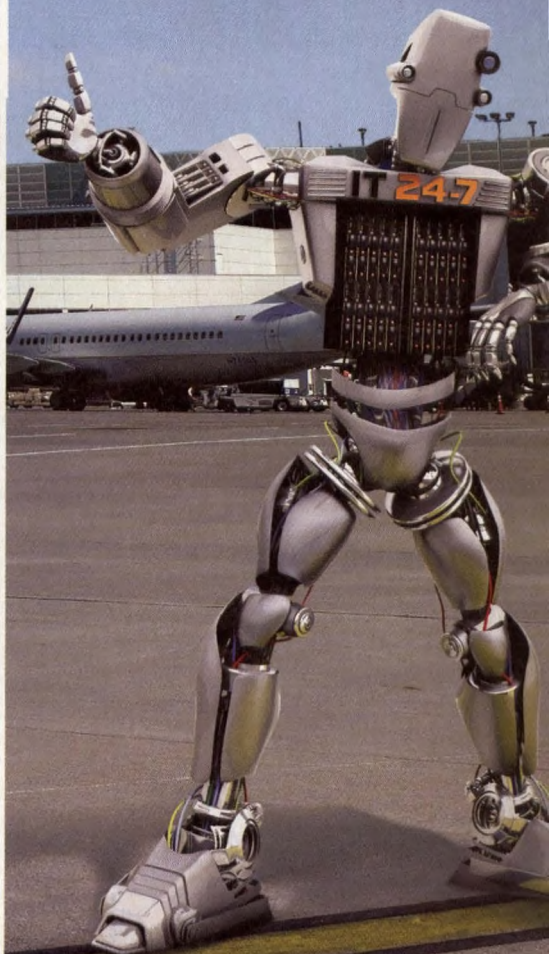
"The server performance from the user's perspective has been a real eye-opener for us," says CEO Ross Dewar. "Some of our more processor-intensive services, like Microsoft Office Communications Server or Outlook Voice Access, run noticeably smoother on Hyper-V compared with the older Microsoft Virtual Server 2005 technology."

Performance wasn't the only obstacle eMantra faced in the past: "We were using Virtual Server 2005, but it had its limitations in



Windows Server 2008. The server unleashed.

Flight crews don't have an office to check into. At Continental Airlines, they have the Web-based Crew Communications System, where they log on, check schedules, and trade shifts. To ensure everyone arrives on time, they migrated to Windows Server 2008. Get the full story at microsoft.com.au/unleashed



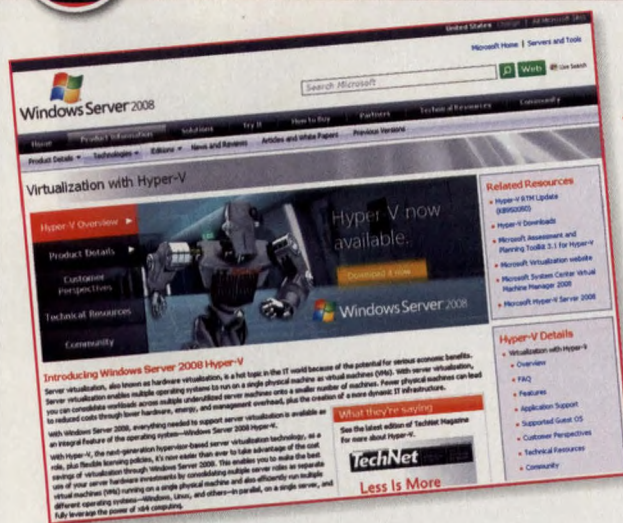
Windows Server 2008

When 40 million customers show up at Dell.com, who helps greet them at the door?



apc insight

virtualisation



Hyper-V comes with Windows Server 2008.



terms of performance," he explains. "There were certain applications we just couldn't deliver from virtual servers using the old technology: for example, we had no flexibility to offer a dedicated Microsoft Exchange environment out of anything other than a physical server."

Most important to the fact that Hyper-V works so well is not just its appeal to customers, but the fact that it has helped Microsoft mount a viable counter-argument to that of VMware, which over the years has risen to a seemingly insurmountable lead in the burgeoning virtualisation market. In 2007, IDC figures suggest, VMware had 76.4 percent of the global virtualisation market; second-place provider IBM doesn't even sell software for virtualising commodity servers but virtualises its mid-range and high-end servers and storage extensively.

In terms of market share figures, Microsoft might as well have not bothered to show up to the virtualisation game in the past. And its entrance into the market simply makes it one of several contenders for VMware's crown; Citrix Systems, which is integrating virtualisation deep within its own product range after its purchase of the open-source XenSource hypervisor platform, is pursuing the market with equal vigour, although without the benefit of its own operating system.

Hyper-V, however, is different for one critical reason: it sits on top of the operating system rather than replacing it. VMware's ubiquitous ESX Server, by contrast, is a 'bare-metal' operating system that is installed on systems instead of W2K8 or Linux.

Microsoft always needed a convincing argument to keep its W2K8 in control of virtualised systems, and found it by pushing Hyper-V as a companion to the stripped-down W2K8 Core. Core is a minimalist install of the operating system that eschews most of its frills to put Hyper-V in the driver's seat, while retaining enough of Windows so that system can fit into a broader Windows-based data centre and be managed consistently using high-level security, upgrading, back-up and other tools.

That, says Armstrong, makes it an ideal

platform for Hyper-V (Microsoft's official recommendation is that Hyper-V always be installed on top of a W2K8 Core configuration). "When you're writing a virtualisation platform, you spend a lot of time doing things like memory management, resource scheduling and doing these building blocks," he says.

"We already have a fantastic memory manager in Windows, and a fantastic schedule, and we've been able to work very closely with the people who wrote Windows to make sure we're taking advantage of that wherever possible. We see competitors making a big fuss about new features they've added, and we think 'that took us about two weeks to implement on top of Windows'."

The University of Canberra's Townsend knows the value of this all too well: by leveraging W2K8's Volume Shadow Copy Service (VSS) — a core feature of W2K8 — the University regularly makes point-in-time snapshots of all its virtual machines, then backs up those snapshots using existing back-up tools, without interrupting the system's operation.

"Virtualisation allows us to add a huge amount of value to disaster recovery," says Townsend. "If a server blows up, I can restore it from a single file; previously, I had to find new hardware, install the operating system, restore the information onto it and hope everything runs perfectly. Hyper-V is giving so much time back to us that we're now able to tackle problems we couldn't tackle before."

As a core service in W2K8, VSS is already well supported in existing enterprise back-up systems. This is in stark contrast to VMware's virtualisation platform, which takes a minimalist approach to the hypervisor and provides ancillary services through its own management tools — which are external to the actual hypervisor and the servers on top of it.

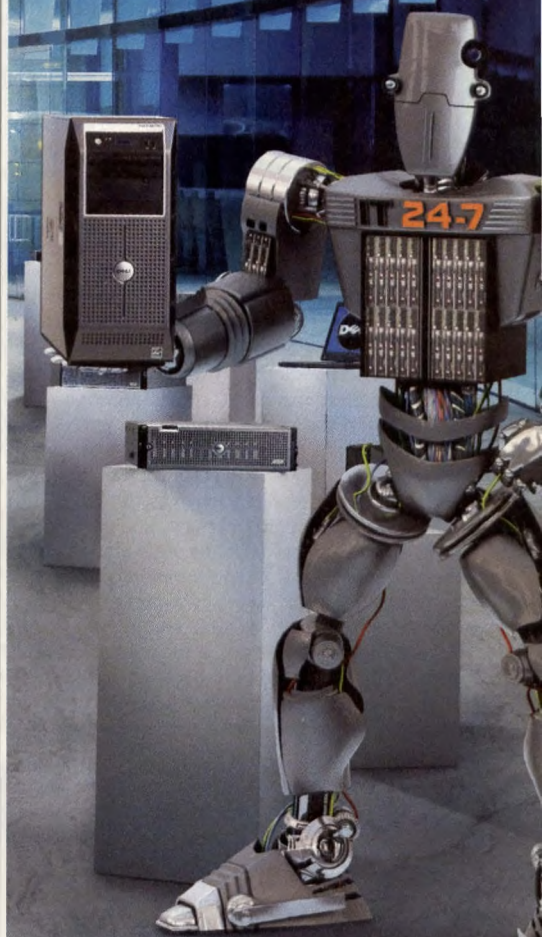
VMware's approach thus shifts the complexity away from the server farm — in theory, allowing the company to centralise management of those servers and isolate them from potential weaknesses in complex operating system services.

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Windows Server 2008

The server unleashed.



Dell.com is one of the world's largest and most advanced e-commerce sites. As a technology leader, Dell relies on Windows Server 2008 for the flexibility and reliability needed to support a mission-critical environment where downtime is not an option. Get the full story at microsoft.com.au/unleashed

 Windows Server 2008

In VMware's philosophy, the bare-metal approach provides more scalability by avoiding the complexity that comes from having large numbers of servers running their own copies of operating systems. Yet management capabilities are essential in virtualised environments, so VMware has to deliver them one way or another.

CEO and president Paul Maritz reiterated this position at VMware's recent VMworld user conference, where he outlined the company's vision of a growing virtual ecosystem that "is not a traditional OS," he was quoted by *Computerworld* as saying. "What we expect is that people will increasingly use the services of the virtual data centre OS to construct new types of application loads that will fulfil the capabilities that you see in traditional operating systems."

MANAGING JUST FINE

If this sounds like a fine distinction, it is: as server virtualisation expands within an organisation, it presents the same sort of management issues for customers that unchecked growth of standalone servers has created in the past. Whether the hypervisor has an attached OS or not, the most important thing will be how the capabilities Maritz refers to — which pertain to systems management — are implemented.

In recognition of this fact, Microsoft has pushed the management line with Systems Center Virtual Machine Manager (VMM), a management tool that extends Microsoft's existing system management capabilities to virtual machines — and supports Hyper-V, VMware and XenSource machine formats (HP, for one, offers similar cross-platform management capabilities and other vendors

will have to step up to compete).

By using the same management tools for physical and virtual servers, VMM is setting the pace for the rapidly evolving virtualisation management tool. VMware also offers tools for managing virtual machines, of course, but it has nothing to offer in the non-virtual environments where Microsoft has a strong presence.

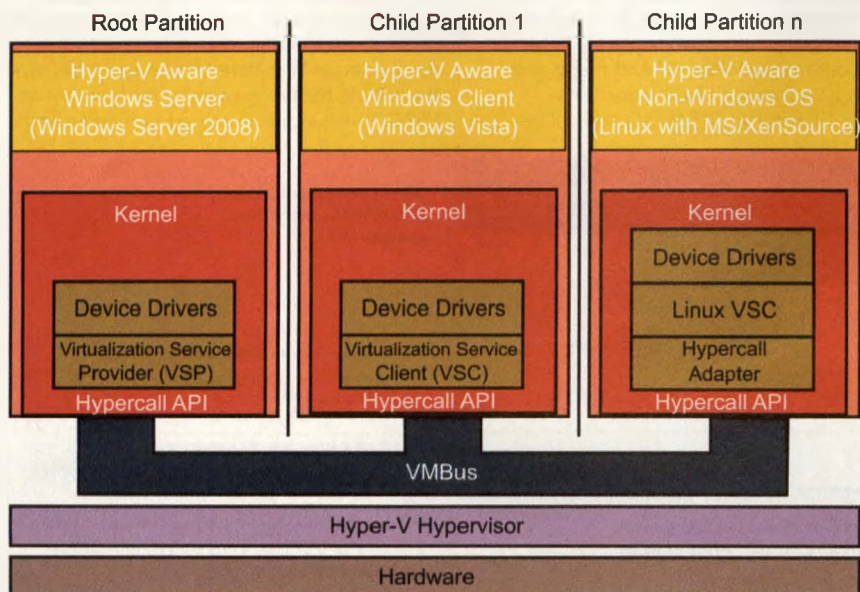
Sam Taylor, technical manager with hosted application provider Productiv, is another recent Hyper-V acolyte, having embraced the platform after several years of trying both Microsoft Virtual Server 2005 and VMware.

Virtualisation allows Productiv's developers to work more efficiently by using Microsoft PowerShell scripts to quickly create and shut down virtual test machines on the fly; PowerShell's role as part of the W2K8 Core means "we can script literally everything," says Taylor. Virtualisation is also used in the new computing environments that are hosted for customers as part of Productiv's core business, with up to 15 customers serviced comfortably per physical server.

As virtualisation moves past its early stages, Taylor believes Microsoft's holistic systems management story will put it in good stead against its competitors. "For me, the biggest thing is control over what's happening, and management of the facilities," he explains.

"Once you get the System Center suite pushed into the virtual environment, there's really no comparison. Hyper-V may have a bigger footprint and slightly bigger memory overhead, but in the scheme of everything the management is a lot more important. At this point, we see no need to go back to VMware; Hyper-V is doing exactly what we're after." **CTC**

The Hyper-V architecture





EXPERTS SOLVE YOUR COMPUTING PROBLEMS

The combined staff and readership of APC Magazine and apcmag.com is like one giant helpdesk! If you have a technical problem, chances are one of us knows how to fix it.

HARDWARE

THE SURPRISING SECRETS OF LCD DISPLAY REPAIR

Q I have somehow managed to make quite a long scratch on my laptop's screen and wondered if you know of any way I can repair it?

Christian Milton

A Apparently, the optical properties of Vaseline and LCD display plastic are very similar. For a temporary and very safe fix, you could try cleaning the surface of your screen and filling the scratch with Vaseline, gently wiping off the excess so that you leave some inside the scratch. Some people also swear by using a pencil eraser to rub out the scratch, although we have never tried that method.

There are a few commercial products available in computer stores that you can use for more permanent repairs, such as Displex. However, if you want to fix your screen right away, you could try what many professionals do and take some Brasso or another metal polishing paste (or, if you don't have this, a gentle toothpaste) and carefully rub it around the damaged area. This will polish the scratch out by bringing the area surrounding it down to the same thickness as the scratch. You should then patiently buff the screen to a nice finish as you

would anything that has just been polished. The only problem with this solution is that when viewed from certain angles, the polished area will be noticeable. This is because the screen's anti-glare coating will have been removed.

If you wish to renew the overall look and feel of your screen, you could take a large piece of card with a 1cm-hole cut into the middle. Place it a few centimetres above the damaged area and spray very short and gentle puffs of clear lacquer through it. The hole will prevent the lacquer overshooting the damaged area. To get this right you should practice on an old magazine or newspaper a few times first.

Remember that although these are 'secrets' that laptop repair shops often employ, you use these techniques entirely at your own risk and APC accepts no responsibility for the results.

edited using a plain text editor such as Notepad. Alternatively, you can use Outlook preferences to edit the dictionary. Navigate to the Outlook menu 'Tools > Options > Spelling'.

Inside this dialog, select the 'Edit' button to reveal the dictionary opened in your text editor of choice. It's possible to have more than one custom dictionary, which is useful if you make regular use of specialist terminology. Simply rename 'custom.dic' to something else ('custom.old', for example) and create a new dictionary for use only in other tasks. Using Word, select 'Tools > Options > Custom Dictionaries' to create new dictionaries and change the default dictionary. The default dictionary chosen in Word will now become the default dictionary used for Outlook.

TIP FOR WINDOWS

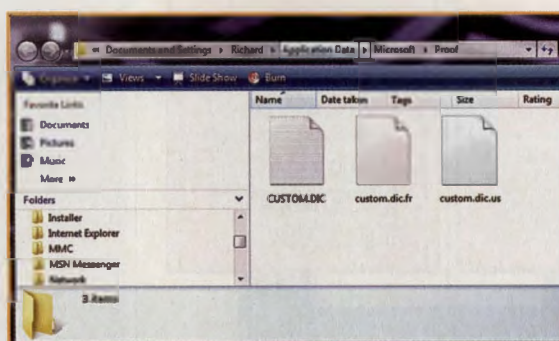
CREATE A SET OF DICTIONARIES FOR USE WITH VARYING TASKS

Outlook is part of the Microsoft Office Suite and shares Word's dictionary. By default the Microsoft Word dictionary is placed in the Application Data folder (C:\documents and settings\[username]\Application Data\Microsoft\Proof\CUSTOM.DIC) and can be

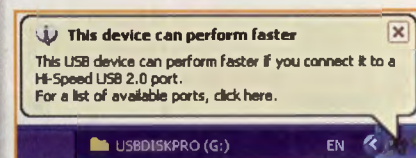
HARDWARE

PC ONLY SUPPORTS USB 1.1

Q Whenever I plug a camera or external hard drive into one of the USB 1.1 ports on my old laptop, Windows XP informs me that I could get better performance from my device if I connected it to a USB 2.0 port. It says: 'This device can perform faster'. However, when I click the bubble, the system admits that there are no USB 2.0 ports available on my machine. So why



Create and edit dictionary files to make them task-appropriate.



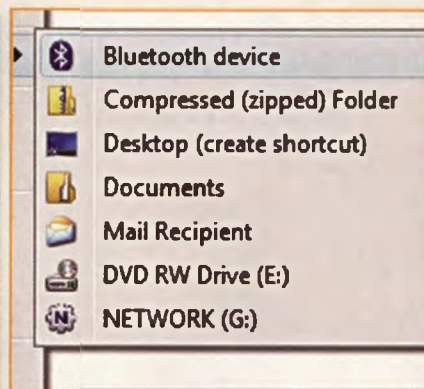
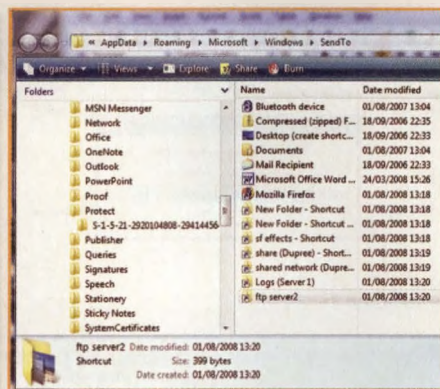
There are commercial products available, such as Displex, but you can also use Brasso or even toothpaste.

We don't know why XP displays this message even if you don't have any USB 2.0 ports, but we know how to turn it off.

TIP...

CUSTOMISING VISTA'S SEND TO MENU

IF YOUR 'SEND TO' MENU IS BECOMING A LITTLE TOO BUSY TO BE USEFUL, HERE'S HOW TO REGAIN CONTROL.



1 IDENTIFY THE CLUTTER

Right-clicking over any document icon sends it to one of a number of destinations. Every physical device hosted by the system will appear as a target, as well as options to send to documents, printers and email. However, other applications and folders can also creep into this area over time, making it hard to see what you want through the clutter.

2 MODIFY THE 'SEND TO' FOLDER

The location of the Send To folder is hidden deep inside your personal user area. Navigate to the following location to find it: 'C:\Users\[Username]\AppData\Roaming\Microsoft\Windows\SendTo'. Within this folder are shortcuts to all of the locations that are available to the Send To menu. Delete shortcuts and add new ones until you're happy.

3 KEEP THE MENU TIDY

The 'Send To' menu is now tidy, easier to use and ready for new applications or devices as they are introduced to your system. Programs, devices and locations can all be used as targets for the menu, making it easy to send your files where you want them. It's also handy to keep a back-up of old sent items by copying them to another folder.

does it show me that message in the first place, and can I stop it doing so?

Alex Vogt

A As far as we can tell there's no complete solution to this problem in Windows XP. Unfortunately, it appears to be what we would call a 'feature'. However, if you wish, you can remove that message by disabling all USB error messages. In 'Device Manager', click on the USB host controller, then click the 'Advanced' tab and check the box on the bottom of the window that

says 'Don't tell me about USB errors'. You will need to do this for each USB controller listed under USB in the Device Manager so that the error message will not appear, regardless of which port the device is plugged into.

TIP FOR WINDOWS

EVENT LOG TRIGGERS

The Vista event log records instances as they occur. Events can be minor, such as a failure to retrieve a DHCP address from a slow-responding server, or major, such as unplanned restarts and

application failures, but they're all recorded. The event log should be your first stop when searching for clues about why a computer may not be behaving as expected.

Some system problems can escalate quietly over time. For example, a boot disk that's filling up with data generated by a runaway syslog generator won't actually stop the computer until no more memory is left for the page file. The Event Log needs to warn the administrator of system instability by highlighting the frequency of alerts, and this is exactly what the Vista event log is able to do.

The perfect gaming routers



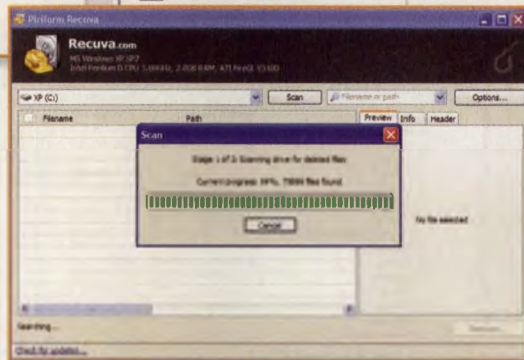
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The dynamic breadcrumb trail can be used to navigate through Vista's folder structure.



It's a good idea to keep a file undeleter such as Recuva handy, on the offchance that you need to restore a deleted file.

Click on any event in the log and look in the new right-hand actions pane for the option to attach a task to the event. The event can display a message on the local desktop, start a program or even send an email. Once set, any event with the same ID as the event used to create the trigger will cause the action to repeat. Be careful, though, because events triggered by an attack (such as a virus infection) can be generated repeatedly. You'll find it harder to regain control of your system if it's too busy trying to send alert emails telling you it's happening.

WINDOWS

EXTENDING LAPTOP BATTERY LIFE

Q To increase the battery life on my Vista laptop, I always turn Aero and anything else that might consume extra battery power off. I then turn it all on again when I plug it into the charger. I know this works because I have timed the battery life with and without these features and the laptop battery definitely lasts anything from 15 minutes to half-an-hour longer. The only problem is changing all those settings back and forth all the time is quite annoying, so I'm writing to ask if you know of a way to automate this.

Michael Berry

A There is a handy little utility called Vista Battery Saver (www.tinyurl.com/vistabs) which does exactly what you need. Running in the taskbar and using a meagre 5.5MB of memory and zero per cent CPU time, it will do all the work for you by enabling and disabling customisable features when the power source is changed, or battery power falls under a certain percentage. The program is fully configurable and, once set up, you can leave it and forget all

about it, knowing that your battery will last as long as is physically possible under Vista.

TIP FOR WINDOWS

EXPLORE YOUR PC WITH EASE WITH A DYNAMIC BREADCRUMB TRAIL

The Vista Explorer window contains views of any folder that you open within Vista. It's the default shell for Vista. Just like in XP, views can be changed to suit your working methods. Click on the 'Views' icon in the top left, to see a selection of alternatives. One slightly annoying feature of Vista is in the way that Microsoft has adopted the full set of XML tags. This means that by default, your documents window sorts the contents of the folder by Rank, Genre and Album — hardly useful for last year's accounts.

Change the columns to something more useful by right-clicking over the column heading and choosing alternatives (date, type, size and so on) from the menu. Click on any column heading to sort in ascending or descending order. Above the folder list, you'll see the breadcrumb trail. This is an enhancement for Vista from the XP path. In XP Explorer, the path is displayed as you tunnel down through the structure. In Vista, the path is also displayed, but this time it's dynamic.

Clicking on a section in the breadcrumb trail immediately takes you to that folder, while clicking on the small arrow to the right of the section reveals a list of sub-folders available from that folder. Right-clicking on the breadcrumb trail gives three options: 'Edit Address' removes the dynamic path and replaces it with plain text; 'Copy Address as Text' copies the path as plain text into the Explorer clipboard, from where it can be pasted to any document; and 'Copy Address' copies the path

contents to the clipboard.

The clipboard can then be pasted as a shortcut, or the entire contents of the target folder can be copied to any other folder if the right-click 'paste' option is used.

WINDOWS

RECOVER DELETED FILES

Q I recently emptied my Recycle Bin, only to find an important document was in there. Luckily, I had a back-up from the day before and I only lost about two hours work. Is there a tool I can use to undelete files in case I do this again?

William Stuart

A Although it is possible to restore deleted files, it's not possible if the space the data occupied becomes overwritten with something else. Therefore, as soon as you realise that you may have deleted something you might want to recover, you should stop whatever you are doing. Do not save anything you may be working on.

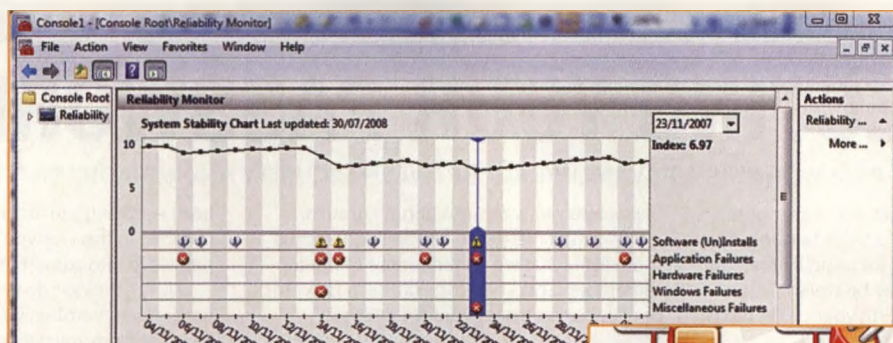
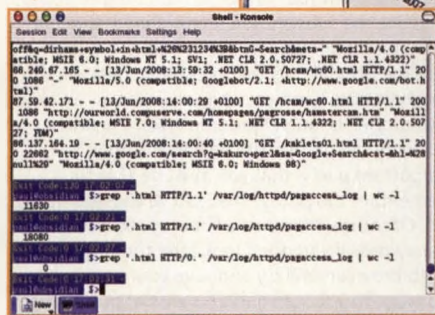
Then, either use a commercial tool that you may have available — such as Norton Utilities — or quickly download a file undeleter. We recommend Recuva (www.recuva.com). Not only can it recover deleted files from a hard disk, but it's also handy for restoring erased files from thumb drives, camera memory cards and even MP3 players.

TIP FOR WINDOWS

USING THE VISTA RELIABILITY MONITOR

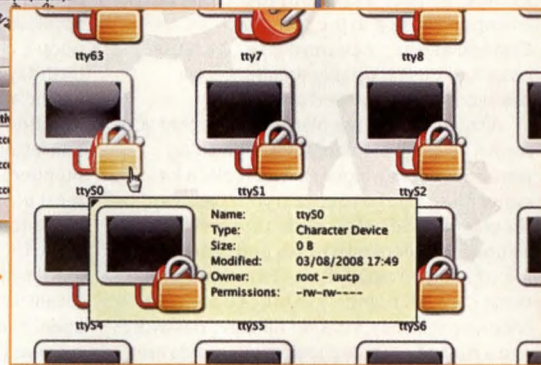
Microsoft has long included performance-monitoring tools with software based on the NT Kernel. However, as every NT greybeard knows, ending the root causes of problems using only

Count hits or trace a user's navigation through your web sites.



Using the Vista Reliability Monitor, examine severe system events over time.

Each operating system offers a different method of access to serial ports.



Performance Monitoring data is difficult and unrewarding. With Vista, Microsoft has addressed this problem with the inclusion of a Reliability Monitor snap-in in the MMC (Microsoft Management Console).

To use the Reliability Monitor, start the MMC by typing MMC at the Start button and accepting the UAC challenge. With the empty console started, find 'File > Add / Remove Snap-in'. A long list of available snap-ins will appear. Choose 'Reliability Monitor', click 'Add' to add it to the list of snap-ins displayed in the console and then press 'OK'. The Reliability Monitor uses data collected by the event service to produce a graphical display of your system history. System reliability is shown as a graph with its pinnacle scoring a 10. Days in the event history are displayed as nodes on the graph; click on a node to see any available data.

Significant events like software updates or application faults are indicated underneath the graph. Unsurprisingly, installs of pre-Vista

software are often followed almost immediately by application faults.

The reliability monitor is a useful tool, both for monitoring the health of your system and also for pointing out to the user how the casual installation of software can cause unseen problems under the hood.

TIP FOR LINUX

CONCENTRATE YOUR LOG DATA WITH 'GREP'

A web server's log can fill with thousands of hits after a short time, each residing on their own line. If you want to display the total lines in the file, you can use either 'wc' (word count) from the command line to display the total or you can hover your cursor over the file icon in Konqueror to achieve the same result. These lines include various file types, so how do we establish the number of pages that have been downloaded? The 'grep' command will analyse each line in a

file and attempt to match a pattern with it.

If that match is successful, it displays that line. Each record in the log file begins with an IP address, followed by some fields and, finally, by the file requested by the client in the form of 'GET/some/directories/yourfile.html HTTP/1.1' (or /1.0). The most common string is '.html HTTP1.'. If this is used, your matching string will display pages containing lines from your log file. Next, we apply the 'wc' command to 'grep' using a pipe. So in the '/var/log/httpd/' directory, your command would appear like this: `grep '.html HTTP/1.' access_log | wc -l`. This would result in the number of lines from your log file, which can be redirected to a file using the following command:

```
grep '.html HTTP/1.' access_log > Desktop
extract.txt.
```

You now have a file where data from your web server can be examined easily.

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HARDWARE SUPER TIP

TIP!

PROTECTING YOUR PASSWORDS

CREATING STRONG PASSWORDS IS A BALANCING ACT BETWEEN SECURITY AND MEMORABILITY.

Despite the flood of stories about computer security in the press, few articles talk about good password creation, focusing instead on how your information may be stolen. This is strange, because protecting your password is an important step in the security chain. Creating a secure password is key, because password theft is usually secondary to a password being guessed or cracked.

Although there are plenty of ways that your password can be stolen, such as phishing techniques or key loggers, it's usually a lot easier for someone to obtain your password by simpler methods. Most of us have to remember a huge number of passwords and other security information on a daily basis. From bank and credit card PIN numbers to office door entry codes, email, eBay, internet banking passwords and a host of other site logins, our minds are crammed with security details. And if you work in the type of office that has proper IT security policies, you'll probably have to change your Windows login on a regular basis.

The human brain, while able to hold a phenomenal amount of information, has difficulty remembering information unless it's grouped. This is why we split phone numbers up into groups of three or four numbers when learning and recalling them. Unfortunately,

passwords rarely fall into natural groups, making them harder to remember and thus more likely that we either choose easier to remember (and, therefore, guess) passwords, or use the same password for multiple applications. It's for this reason that many people choose passwords based on their birthday or pet names. A lot of people even go for the amazingly obvious 'password'.

Although the traditional advice has been to mix letters and numbers, or even substitute numbers and special characters for letters, most password-cracking programs that use brute-force dictionary attacks are now savvy to these tricks. So, if your password was originally 'battleship' and you changed it to the idealistically more secure 'b4ttl35h1p', the chances are that it's actually going to be cracked too.

The key to creating a secure password that is not easily guessed or cracked is to use a technique called 'salting'. What this means is that you take a password that already contains substituted characters, and throw in some random numbers. For instance, you could take your existing password 'b4ttl35h1p' and add a number that only you would know but which is easy to remember — such as the number of your parents' house, and the month you were

born — taking the first numeral from each number. In this way you could transfer your password into something like 'b4t2tl35h17p'.

This technique does make the password harder to remember, so an alternative is to use a phrase from your favourite film, song or book, and use the substitution technique for that. So, if we take 'Star Wars' as our example, we could use the phrase 'may the force' and change it to 'm@yth3f0rc3', which, while easier to remember, is much harder to crack. The more obscure the phrase, the better. The only important part is that you must be able to remember the phrase that you've chosen!

Of course, it's no good having secure passwords if you don't look after them. Most web browsers will try and save your passwords for you. You should only choose this option if you're sure that no-one else will be using your computer to access the sites where you have saved the passwords.

If you're using a public computer, make sure you use the browser settings to clear private data such as passwords and the cache after you've finished your session. If you're really bad at remembering passwords, then you could use a password manager such as KeePass — as long as you can remember the all-important master password, that is!

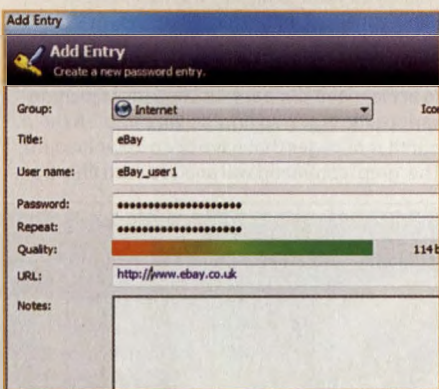
TIP...

SECURITY

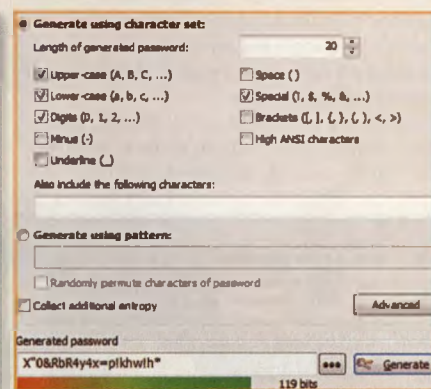
HOW TO USE KEEPASS TO MANAGE YOUR PASSWORDS — JUST DON'T FORGET THE MASTER KEY...



1 CREATE THE MASTER KEY
Install the KeePass software from <http://keepass.info>. When you start the program for the first time, you need to create a master password, so make this as long and secure as possible using the tips given above.



2 ADD YOUR PASSWORDS
To create a new password, right-click in the right-hand window and choose 'Add New Entry'. Choose the type of password, for example, email or banking, from the drop-down list, and then enter all the relevant details.



3 GENERATE SECURE LOGINS
No good at creating your own secure passwords? Use the built-in password generator to create one for you, although you'll probably find it even harder to memorise. Don't forget to save all new entries to the database, too.

Edit

Help



Ask the questions

Get quicker answers to your questions. Send them to

<http://apcmag.com/askapc> for other expert readers to answer online.

A selection will continue to be published in the magazine.

Q I was just curious as to whether it is possible to turn my laptop into a Wi-Fi hotspot. My laptop is an Acer Aspire 5310. I upgraded the RAM to 1GB and downgraded the operating system to Windows XP and am using a Bigpond Next G PCMCIA card for internet access. The reason why I want my laptop to be the hotspot is so my Nokia E61 can access the internet. Please help.

Jaime

Q I cannot get an Optus Wireless Internet connection (Huawei E220 USB Modem) to work on Gutsy Gibbon (Ubuntu). The modem is recognised as a USB drive but I do not know what system changes, if any, should be made.

Allan McLaine

Q I need a little help with network authentication on my Windows Vista Home Premium machine. The problem is I am a school student and I have been given access to the school's wireless network, but to access

it I have to disable computer authentication when connecting, and as I'm using Home Premium the authentication tab doesn't show. Does anyone know a trick, like registry editing or policies, etc?

Q How can we configure our email addresses to send an automated reply to those email accounts that send us junk emails which fill up the space in our Outlook Express? We would just like to make sure that only the senders of these junk emails receive the automated response.

Miriam Espinoza

Q I would like to create a macro (if that's the correct term) for an Excel sheet, where once you click on a field like Name, Company, Phone Number etc., a message box comes up asking relevant question such as 'What is the Company's name?'. Then, after the user inputs a company name, he or she would have to click on

'Next'. The next message box would then appear for the next question and field to be filled out. Is this possible with Excel?

Kenneth Lau

Q After installing Spybot Search and Destroy on my neighbour's computer running Vista Home Basic, I clicked the Immunise button and received a prompt saying that I 'don't have sufficient privileges to perform this operation' and that I 'need to do it from an elevated level' (or something to that effect). How do I do this, as there is only one account on the computer (his)? It is not possible to right-click and select 'Run as Administrator' or the like.

Bruce Pierson

Q I have recently had my IP address with BigPond changed by them from the default Dynamic IP address to a Static IP address. In doing this, is there any advantage to me and/or to BigPond?

Noel Andrews

Answer the questions

If you can answer one of the questions above, please go to the web address listed at the end of each question. Each month we publish the best of the questions and answers in the mag. You can still send your answers to us via email at <http://apcmag.com/askapc>, but we encourage you to post answers online so readers get quicker responses.



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SEARCH ENGINE OPTIMISATION

**Part 3
OF TWELVE**

Writing for humans and search engines

WHAT'S COVERED

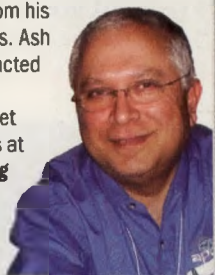
Overview

In this new Masterclass series, Ash Nallawalla walks you through everything you need to know in order to make your web site optimised for search engines. By the end of the Masterclass, you'll have all the tools at your disposal to generate traffic and get hits on your site.

ABOUT YOUR TUTOR

Ash Nallawalla

Ash Nallawalla manages natural and paid search traffic for some of Australia's largest web sites. He is an internationally acknowledged expert in search marketing and he previously operated an SEO training business. This article series is excerpted from his training notes. Ash can be contacted at seo@acp-magazines.net and he blogs at www.netmagellan.com.



Did you build a website and nobody came?

Ash Nallawalla explains why and how you can attract the right visitors. Last month we examined how searchers and search engines operate. This article shows you how to write content that will please both users and search engine algorithms.

The other day I read a blog post that made me stop and think, "Now that is quality content". What made it thought-provoking is that the author, Jane Copeland, said that she hears the same "dubiously meaningless things" about SEO constantly repeated by conference speakers. She was referring to the oft-doled-out advice: "Write good content", which is lapped up by the audience without challenge and usually with a knowing nod (<http://snurl.com/3nh7b>).

Jane's point was that newbies are not stupid — they do not set out to write rubbish. Experts should be more specific when giving this advice. So, what is good content?

WRITING FOR HUMANS

Google recommends writing for humans, not search engines. This is good advice and it means writing the most compelling English to achieve the desired outcome (usually to sell or to inform). However, without further detail, this becomes "dubiously meaningless" advice. If there were no search engines, web sites would resemble brochures that were largely pictorial or full of marketing puffery.

There's the rub. You have to write for humans and search engines, but in equal measures. Potential buyers use search engines at some or all stages of the buying process — sometimes this can be within a single browsing session.

THE BUYING PROCESS

You don't have any control over search engine algorithms, but you do have control over your web site. You have to plan the site content, mark-

up, navigation and architecture. For now, let's look at the content.

The typical buying process goes like this:

Purchase stage	Conscious thought process	Subconscious process
Problem recognition	The consumer perceives a need and becomes motivated to solve a problem.	Motivation
Information gathering	The consumer searches for information required to make a purchase decision.	Perception
Alternative evaluation	The consumer compares various brands and products.	Attitude formation
Purchase decision	The consumer decides which item to purchase.	Integration
Post-purchase evaluation	The consumer evaluates their purchase decision.	Learning

By recognising human purchase behaviour, you should write parts of the web site using the words that people use during those stages when they use a search engine. Keep marketing puffery to a minimum, because people don't use such language in their search queries.

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of your industry and be attuned to the needs of users. For example, if your web site sells digital cameras and the new models have image stabilisers, you would use text such as appears in the example here:

Purchase stage	Sample web site content
Problem recognition	"This long-zoom camera is perfect for people whose photos are always blurred, as it has an image stabiliser." (For a reader with unsteady hands who takes blurred photos)
Information gathering	"12-megapixel KX-1234 SLR camera" (Include lengthy, descriptive text and feature lists, including phrases such as "image stabiliser" and references to shaky hands and blurred images)
Alternative evaluation	(Offer reviews of many cameras and include feature comparison tables with a column for "Image Stabiliser")
Purchase decision	(Display the price, user reviews, ratings)
Post-purchase evaluation	(Ask customers to send their reviews and possibly offer some incentive)

If you create relevant, convincing content for some of these stages, you will attract and retain readership with the help of search engines. Although every stage is important, you should pay particular attention to the purchase decision stage so that the reader will

notice a 'Buy Now' button or an affiliate link and place an order. After all, you need the web site to earn its keep.

WRITING FOR SEARCH ENGINES

Ten years ago the early SEOs used to write repetitive text that was terrible to read but worked well for ranking. Popular engines such as AltaVista had simple algorithms that counted the incidence of phrases on a page and then gave prominence to the page containing the most occurrences.

Here is a recent example of a page that is trying to rank for the term "Best SEO firm" (bolding ours): "If at all you have to hire the services of a professional, then make sure that you hire services of the **best SEO firm** operating in your city. You will be spending money for this, and you must get the **best** worth for your money. There will be many **SEO firms** in operation and you will not find much difficulty in finding out the **best SEO firm** to do the work for you... To find the best SEO firm, you will have to check out various aspects of the firm... **Best SEO firm** must make sure that the site is designed according to major search engine norms. Attaining a high rank in all major search engines is the priority of all online business sites, and the **best SEO firm** must help you in doing exactly this. Make sure to periodically check out the quality and quantity of work done on your online business site. This will keep you updated on the work that is being done on your online business site. You just have to make sure that you hire the services of the **best SEO firm**."

Such content was obnoxious even in the early years, so it was a common trick to display the text in a colour that was the same as the background. Today such mind-numbing, repetitive, ungrammatical content will not work for Google and users alike. Google uses a technique known as Latent Semantic Analysis — LSA (SEOs also refer to it as Latent Semantic Indexing — LSI, <http://snurl.com/3naoj>).

In simple terms, LSI enables the search engine to classify the relevancy of a page with human-like skills. For example, a page about search engines will not show in a search for car or marine engines. Similarly, Google 'knows' that a search for "blinds" is not about blind people and a search for "blind resources" is not about window coverings.

Note that each page is a search engine magnet. Think of your web site as individual pages — if you offer five services, don't write five paragraphs on one page! Write five pages, each optimised for that service.

If you write in a natural manner for your audience, you won't need to worry about LSI. Do not count phrase occurrences or be distracted by keyword-density percentages. But be sure to include your valuable phrases and use them only when appropriate to the context.

Once optimised an office furniture retailer's online catalogue by inserting the word "chair" after the model names, because it was completely absent from thousands of pages! The catalogue had pictures of chairs with fanciful model names, dimensions, weight, colours, etc., but never the word "chair".



Book Reviews

Recommended CRM Books

I recommend the following books only because they align with some of the ideas that I use in my CRM and lead management practice. Click on the images to order from Amazon.



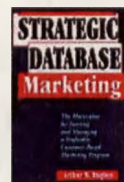
Review



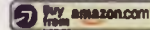
Review to come



Review to come



Review to come



CRM Book Review by Ash Nallawalla

Customer Relationship Management: Getting It Right
by Judith W. Kincaid
Published by HP Books and Prentice Hall PTR
ISBN: 0-13-035211-X
US\$39.99

This is the type of book all CRM practitioners would love to write, except that author Judith W. Kincaid has done it - and with finesse. Only a practising CRM manager who has been through an implementation will understand what I mean after reading this book. There are so many articles and books out there that bear no resemblance to one's own experiences in the trenches. Those authors appear to have yet to go into

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A book review is a search engine magnet and an opportunity to place affiliate links and contextual ads.

FINDING FRESH CONTENT

Business sites tend to remain static. Just as a printed brochure is designed during a marketing project and then forgotten until there is a need to change it, a web site runs the same risk. Fresh content causes search engine spiders to come back frequently and human visitors will appreciate it too. This isn't easy for a small business.

Make it a part of someone's job description to update the site's content regularly. This could be a page about a new product, a sales promotion, a press release, a speech by a corporate executive, and so on.

An information site should hire great writers, so that their articles will encourage readers to bookmark the site and keep coming back. A forum will attract user-generated content (UGC), but forums need good moderators to keep spam out and keep discussions on-topic.

ORIGINALITY

Original content means that there is no copy of that content online. It is not possible for 100 travel sites to say "Canberra is the capital of Australia" in 100 different ways, but when you copy entire paragraphs from another site, it is trivial for the search engines to notice it. If you are working on a site that was authored by someone else, assume the presence of a copy somewhere, until proven otherwise.

Even if your site is the original, an online copy made by someone else with or without permission needs to be found and something needs to be done about it. Multi-national companies face a strong temptation to copy large tracts of the parent company's web site. If you work on such a project, get approval to build largely unique versions for each country.

Copyscape.com (<http://www.copyscape.com/>) is a good place for finding duplicate sites. Always make it a point to check your URL there and see if it can find a copy. If it cannot, find a unique sentence in your material and search for it as a phrase in Google.

Although partial paraphrasing appears to be fair game, rewriting sentence-for-sentence is plagiarism and it can be picked up easily, if not by the original author, by search engine algorithms. Performing research does not mean you should plagiarise. If you commission a third party to write for you, be sure that the contract has a clause that insists on original material to be supplied.

WRITING TO MAKE MONEY

Not everyone builds web sites to advertise their own business or to promote some cause. Many people build web sites to make money. So do conventional online businesses, but I am referring to web sites that either promote someone else's products or that are virtual cash machines. Affiliate marketing is a subject in its own right, so I will skim its surface here and focus on the written content.

An affiliate is a commission agent of a merchant. For example, I can feature a catalogue of digital cameras on my own web site, but the 'Buy Now' link takes the customer to the merchant's site. If the transaction is completed, I will receive a commission.

Remembering our earlier caution about duplicate content, an affiliate site that simply reproduces the merchant's catalogue will not rank high in the organic search results. I made this mistake three years ago when I was making more than \$1,000 a day in commissions and Google suddenly introduced its filters for sites with duplicate content. Now I am lucky

if I make \$50 in a month from it.

You need to create unique content, such as a review you have written yourself. Unless you are a professional journalist, you won't have access to the latest products before their general release, so the next best thing is to review your own purchases or to make friends with a retailer who might lend you a few items to review. By allowing readers to add their opinions or forum posts, you get UGC, all of which makes your site free of duplicate content.

Another way to make money is to build a hobby site featuring a single topic, say, Fiji. Google AdSense consists of JavaScript code you can place on your web pages and you will see text, image or video ads about the same topic. This is known as contextual advertising. If a visitor clicks an ad, you get a few cents commission, and sometimes it can be a few dollars per click.

Your web site about Fiji would attract Google ads related to Fiji — most probably air travel, cruises or accommodation. Your keyword research might tell you that more people search for Fiji cruises than they do for scuba diving in Fiji. So you write about the former topic.

Your next dilemma is whether to write so well that your visitors will devour every word and not click any ads — or write so badly that they might click an ad to escape the site! There is no easy answer, but I suspect that an informative site with a lot of fresh content will attract more visitors (and a few ad clickers) than one with boring, static content. **STUFF**

NEXT MONTH

How to be search-engine-friendly

Australian Internet Data Centre: Think Globally, Host Locally ...premium quality at affordable prices

WEB HOSTING

Australian located dedicated web servers.
Personal and small business hosting at
affordable prices.

- from \$66/yr
Reseller plans available.

cPanel Hosting
50MB Storage
2GB Bandwidth
\$66/yr

DEDICATED SERVERS

Entry level to Enterprise Dedicated Servers
available. Hosted on our redundant
Cisco Core Network for optimal reliability.

- from \$176/m
Available in Brisbane and Sydney

Dedicated Servers
QUAD-CORE SERVER
Performance Servers
300GB Bandwidth
from \$275/m

CO-LOCATION

From 1 Server to multiple cabinets. Our own
state-of-the-art, Carrier Neutral facility
served by multiple fibre carriers in Brisbane.

- from \$88/m

Dedicated Servers
DUAL QUAD CORE XEON
400GB Bandwidth
from \$440/m

DOMAIN REGISTRATION

Register your Domain Names now
including .com/.net/.org/.com.au/.net.au

- from \$13.75/yr

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From \$88/m

Co-Location
42RU Cabinet
Various Data Methods
from \$990/m



workshops

HANDS-ON WITH HARDWARE AND SOFTWARE

HARDWARE

SOFTWARE

GADGETS

The universal network

Get your Vista, XP, Linux and OS X machines communicating with ease, writes *Jon Thompson*.

REQUIREMENTS

● REMOTE DESKTOP CONNECTION

The free software from Microsoft for graphically logging into Vista remotely from XP or OS X.

● BONJOUR

Apple's free, zero-configuration OS X printer-sharing software for Windows.

Despite what Microsoft might have us believe, Windows is far from being the only game in town. The Apple Mac's secure and stable OS X operating system has a fiercely loyal band of devotees, and the user-friendliness of Linux distros has persuaded many Windows users to take advantage of a seemingly endless supply of free software. Until now, the problem has been sharing resources between the OSs, and both Linux and OS X are traditionally seen as isolated from Windows for this reason. However, this is no longer the case. Read on to find out how to configure Linux, OS X and Windows to freely share each other's resources, and in some cases, even log into each other.

SHARING OS X FOLDERS WITH WINDOWS

OS X uses the same open-source Samba software as Linux to share data with Windows machines, and setting it up is quite simple. First, in OS X, we need to create an account for users to log into. From the Apple menu, choose System Preferences. In the View menu on the resultant window, choose Accounts. Click the '+' button to add a new user and enter a full descriptive name and a short name. The short name is the username you'll enter when logging into the Mac. Finally, enter a password.

Next, we need to turn on file sharing. In System Preferences, click 'Sharing'. This brings

up a list of all the resources that OS X can share. Highlight 'File Sharing' and ensure that it's ticked, then press 'Options'. Make sure that 'Share files and folders using SMB' is ticked and select the username you want Windows users to log in as to access the files you decide to share. Then click 'Done'.

You can now add folders in the 'Shared Folders' list by clicking the corresponding '+' button. You can also add users to the 'Users' list and use the up and down arrows to define the access they will have to the folder.

To mount the shared folder in Vista, click on Start and then on the 'Network' option. Your Mac should appear. Double-click on it, enter the username and password for the account you set up in OS X to access it, and you should see the contents of the shared folder. In XP, click on Start and then 'My Network Places'. In the Network Tasks bar, select 'Add a Network place' to invoke the wizard. Click 'Next' and browse the network to find the shared OS X folder.

SHARING WINDOWS FOLDERS WITH OS X

Accessing data from a Windows share in OS X is also easy. First, click the Finder icon in OS X. Now click the disclosure triangle located next to 'Shared' in the Finder window sidebar to display all of the computers connected to your network.

If you can't see the Windows computer for some reason, you may still be able to connect to its shares directly. In Finder, click on 'Go' and then on 'Connect to Server'. In the address field of the 'Connect to Server' window, enter the URL for the share using the syntax `smb://<server>/<share>/`.

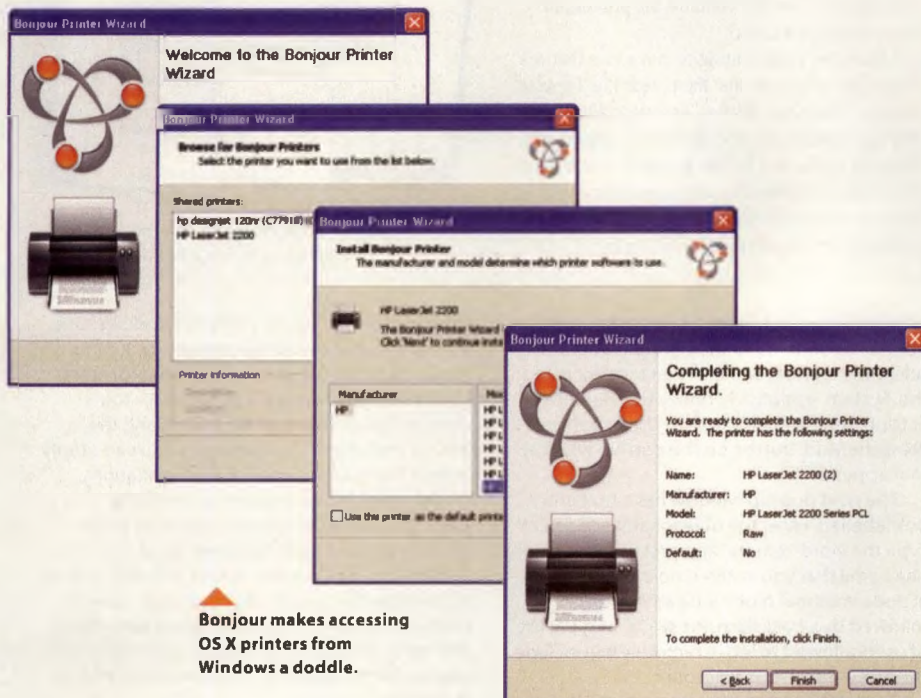
For example, if you have a Vista machine called 'VSERVER' and it's sharing a folder called 'common_docs', you'd enter the following: `smb://VSERVER/common_docs/`. Now click 'Connect'. OS X will prompt you to enter the workgroup, username and password of the share you want to connect to.

It's worth noting here that you can use this technique to connect to another Mac with file sharing enabled or a Linux machine that is sharing out files using its own Samba software. This way, you can swap files directly between the two operating systems.

Most consumer Linux distros should have

Running a network that features multiple OSs needn't be complicated.





Bonjour makes accessing OS X printers from Windows a doddle.

Samba installed by default, making interoperability with Windows quick and simple to use. You can mount Windows shares in Linux and also share out your Linux folders securely to Windows PCs, all with a few mouse clicks. If you can see shares on your real Windows computers from your Mac, you should also be able to see folders shared from Linux, and vice versa.

SHARING A WINDOWS PRINTER WITH OS X

It's possible to share your Windows printer with machines running OS X. In XP, share the printer by selecting 'Printers and Faxes' from the Start menu, right-clicking on the icon of the printer you wish to share and selecting 'Sharing' from the pop-up menu. Select 'Share this printer' and enter a name for it in the Share name field. This name will appear as the printer's name on your

Mac. You can only use the following characters in the name: A-Z, a-z, 0-9, !, \$, *, (,), _ , +, -, ' and a period (full stop). Finally, click the 'Apply' button to share the printer.

On the Mac, choose 'Print' from the File menu and then choose 'Add Printer' from the resulting Printer pop-up menu. Click 'Windows' in the toolbar of the dialog that now appears and browse to the shared printer. If prompted, enter your Windows username and password to connect to the printer.

Select an appropriate make and model printer from the 'Print Using' pop-up menu, and finally, click 'Choose'. If you can see the Windows printer on the Mac but you can't print to it, Apple says that this is likely to be because its name is more than 15 characters long. Simply shorten the name and try to connect again.

HIBERNATING

If you put your OS X system to sleep, when you wake it you may find that printers you're sharing with other Macs have disappeared from the list. Apple's solution to this is to simply add the printer again in the Print & Fax pane of System Preferences or by choosing 'Add Printer' from the Printer popup menu in the Print dialog.

SHARING AN OS X PRINTER WITH WINDOWS

The easiest way to share your Mac's printer with XP and Vista is by downloading a piece of software called the Bonjour printer wizard — see the 'Requirements' box (at left) for details. Bonjour requires Java and the Windows driver for the printer to be installed before you run it. You can get the driver free from the printer manufacturer's web site. A good rule of thumb is that if the printer has an OS X driver, it will have a Windows driver too.

After downloading and installing Bonjour, run it and click 'Next'. You'll see a list of OS X printers that are being shared. Select the one that you want and press 'Next' again. Select the make and model of driver to use from the subsequent list and press 'Finish'. That should be all there is to it!

LOGGING INTO VISTA FROM OS X

You can graphically log into an installation of Vista Ultimate, Enterprise or Business from a machine running XP or any version of Vista using a facility called Remote Desktop Connection (RDC). (See the box directly below for details). What's less well known is that you can also do it from OS X. This is because Microsoft has released an RDC client for the Mac in the form of a universal binary that runs on both Intel and Power-PC Macs. You can download it free from Microsoft. See the Requirements box on the left for more details.

DO THIS...

REMOTELY LOG INTO VISTA

You can remotely log into any computer running Windows Vista Ultimate, Enterprise or Business from both Windows XP Home and Professional using Remote Desktop Connection. It's bundled with each, so if it's not installed, it'll be on your distribution CD. Simply pop this into the drive, wait for the autorun software to take over and then click 'Perform Additional Tasks' followed by 'Install Desktop Connection'.

If you don't have a distribution CD, you can download and install the RDC client package from

Microsoft for free. See the Resources section for details. Once installed, you'll find the program under 'Communications' in the Accessories folder.

Enter the Vista machine's IP address in the 'Computer' box and press Enter. After a couple of seconds, you should see the dark turquoise Vista log-on screen. Enter your Vista username and password as normal and press Enter to log on. You'll be presented with the desktop, gadget bar and so on, just as if you were sitting in front of a PC running Vista for real.



RDC lets you log into the more-capable editions of Vista from XP as if you were local.



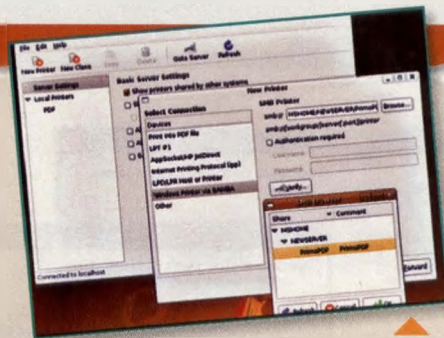
DO THIS...

ACCESS WINDOWS PRINTERS

Using Windows printers from Linux is easy using Samba. In most cases, it'll be installed by default, but if not, install it from your package manager. We're using Ubuntu here, which has it installed by default. After sharing out your printer in XP or Vista, turn to your Linux machine and select 'Printing' from the Administration pull-down menu on the desktop. Click on 'New Printer' and a list of different printing resource types will appear. Select 'Windows Printer Via Samba' and click on the 'Browse' button. Samba scans the network and creates a hierarchical list of

the workgroup. Expand this to see the machines and open the one that contains the printer you want to use from Linux.

Click the 'Verify' button to make sure that you can reach the printer and then press the 'Forward' button. The system will now assemble a list of all the appropriate drivers that it holds. Select your make of printer and hit the 'Forward' button again to select the model. The next screen allows you to input a meaningful name. Click 'Apply' and send a test page to the printer.



Accessing a Windows printer from Linux is just a few clicks away.

To enable RDC on the Vista server, open the Control Panel, select 'System and Maintenance', then 'System' and finally the 'Remote Settings' entry on the left-hand pane. There are three options here. The option to deny access is the default. The other two let you allow connections running any version of the RDC client software or only those running a version that supports Network Level Authentication (NLA). NLA is a new security layer designed to enable remote users to log into Vista machines securely. It creates a secure link before the log-on screen appears. Release 2 of the Mac version of the RDC client uses NLA, so you can select the third option.

In the Control Panel, select the 'Add or remove user accounts' icon and on the subsequent screen press 'Create a new account'. Call it 'remote' and make it a normal user. Select it in the list of accounts, click 'Create a password' and enter one.

Vista administrator accounts are automatically granted remote access rights provided that they have a password on the

account. To grant remote access rights to a normal account, go to the Control Panel and select the 'System and Maintenance' icon, then the 'System' option and finally the 'Remote Settings' entry. Press the 'Add Users' button. Press the 'Add' button on the pop-up window that appears.

The next pop-up window has a text entry box labelled 'Enter the object names to select'. Type the word 'remote' and press 'Check Names'. The name that you entered now changes to include your machine name at the start, followed by a backslash. Press 'OK' and the list of users allowed to log in remotely will include the non-administrator account.

To test the connection, log out and launch RDC on the Mac. Enter the IP address of the Vista server and the username 'remote' and its password, and the Vista desktop should appear.

ACCESS A LINUX DESKTOP FROM WINDOWS

Linux allows you to log in remotely, run programs and have the GUI displayed on a remote machine. With the right software, that

remote machine can be running Windows. One such piece of software is open-source Xming (available at http://sourceforge.net/project/showfiles.php?group_id=156984). You'll need to install Xming, Xming-fonts and the Xming-Portable-Putty packages. You can simply accept the defaults for all three installations.

On your Linux computer (we're using Ubuntu, as ever), install the SSH package (to provide secure logins) and then go to the System pull-down menu, where you must select 'Administration' and finally 'Login Window'. On the Remote tab, change the login style to being the 'same as local'. Finally, bring up a command line and enter 'ipconfig' to obtain the machine's IP address.

Back in Windows, run Putty from the Portable Putty program group. It may give a warning about certificates. Don't worry about this; simply press the 'Yes' button and continue to log in.

Next, we need to run the Xming XLaunch program. Select 'Multiple Windows', press 'Next', select 'Start a program' and press 'Next' again. Select 'Using Putty' and enter the IP address of the Linux machine as well as your Linux username and associated password. Press 'Next' twice, and finally, press 'Finish'.

An X terminal should appear on your Windows desktop. The application is still running on Linux, however. To test if the connection is working, try typing the command 'xcalc' or 'xclock' to see if the output also comes back to Windows.

To run Linux programs in the background, simply add a '&' after the command. `xclock &`

FIX YOUR FIREWALL

If you're very security conscious and use a firewall for internal connections, you may find that you can't see Windows resources from Linux or OS X (or vice versa). This may be because you're blocking the ports used by Samba. On your internal interfaces, allow TCP ports 139 and 445, and UDP ports 137 and 138. Don't ever do this for your internet connection.

Use Xming to run Linux apps while sending their GUIs back to Windows.





Create your own typeface

Give your documents a personal touch with fonts that you've designed yourself, writes *Christian Darkin*.

REQUIREMENTS

● FONTSTRUCT

An online font-building tool:
<http://fontstruct.fontshop.com>

WHAT IS A GLYPH?

A glyph is a symbol representing a letter or character – but it's not the letter itself. In English, we have upper and lower case letters, so there can be two glyphs for each letter. Other languages sometimes have more glyphs that describe the different sounds of letters used in different contexts.

Desktop publishing is a powerful process. It lets you lay out your text in any number of creative ways. However, if you really want to create eye-catching text, nothing beats the control offered by designing your own fonts.

A custom-made font allows you to control not just the layout of your text but its visual style and impact as well. Whether you're designing a stunning title or defining the shape of the main body of your text, taking font design into your own hands gives you the ability to manipulate the way your documents look in a whole new way.

What's more, it's not as hard as it may seem. Designing a font is simply a matter of blocking out the shapes of each individual character. It's up to you how many you create: some font designers will only create the 26 characters of the alphabet, while others will add upper and lower case characters as well as punctuation and numbers. Once that's done, the font can be copied to your PC's Fonts folder, where it automatically becomes available to all the packages on your system. Handily, a TrueType font can be scaled up or down infinitely without the characters losing detail or quality.

GIVE IT A PURPOSE

The first thing to decide when you're creating a

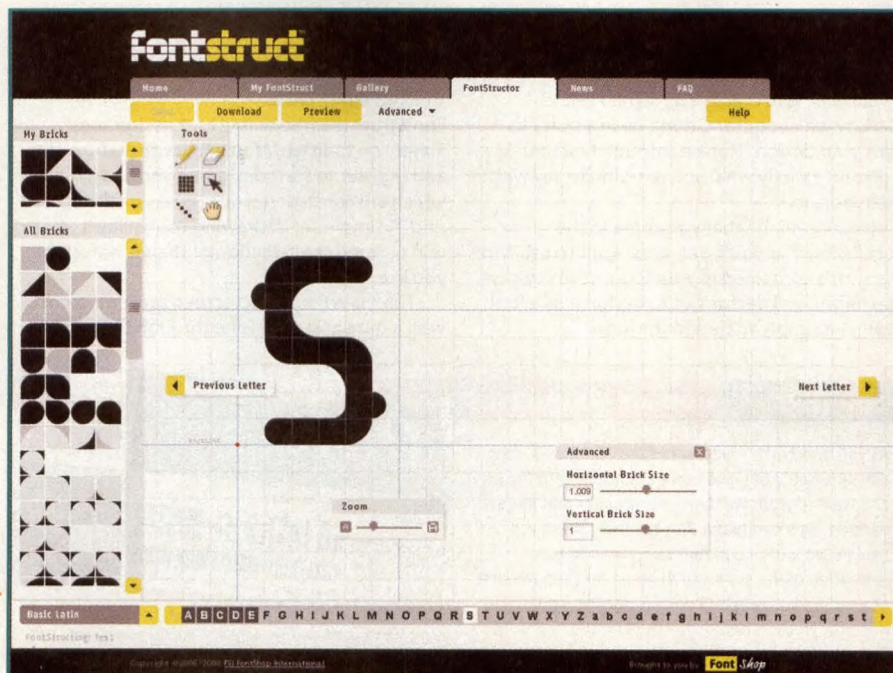
font from scratch is what it's going to be used for. There are plenty of fonts which look great as large size titles but which you wouldn't dream of using in a large body of text. Likewise, a really simple font might make pages of text very easy on the eye, but it would lack impact if used as a headline. Make up your mind early on whether you're creating a font to be used in striking headlines or a body text typeface.

You also need to decide in what context you think your font will be viewed. Text in a leaflet will need to be unfussy and clean-looking, whereas a font for a poster can be highly decorative and complex.

DESIGN DECISIONS

One of the most common mistakes made by a new font designer is trying to pack each letter with style. If you're in too much of a hurry to stamp your mark on your font, it may well end up detracting from the text itself, making it difficult to read. Many fonts employ individual characters that are quite unremarkable; it's when they are looked at together in a body of text that they become distinctive.

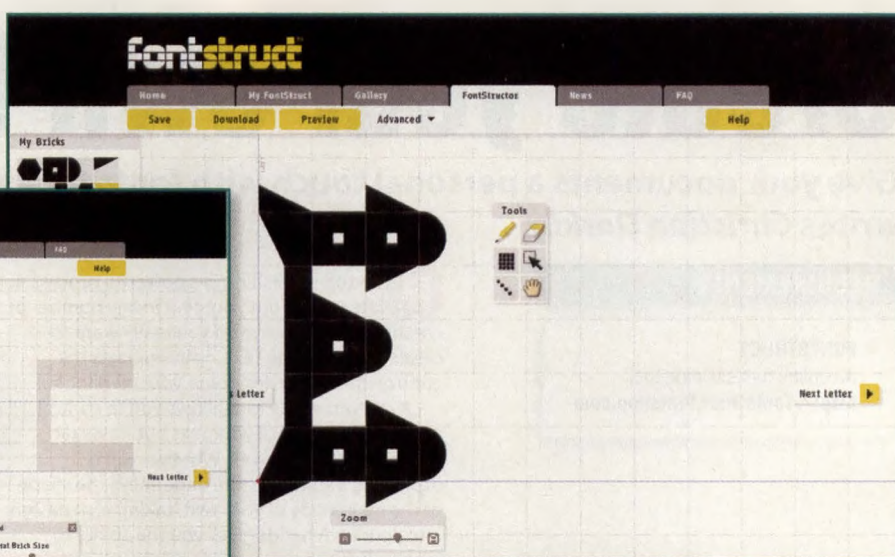
As you get used to the design process, you'll quickly realise how very tiny changes can completely alter the look and feel of a font. Slightly squarer edges on the letters, a minute



In Fontstruct, each letter is constructed out of blocks, making it easy to quickly build a base character to base your design on.



Adjacent Characters lets you see the characters next to the one you're working on.



There are so many different types of building blocks in Fontstruct that you can design unique and unusual-looking fonts with ease.



IT'S USUALLY BEST TO START OFF BY BUILDING UP YOUR LETTERS SIMPLY USING THE SOLID BLOCK SHAPE

adjustment in the size of the holes in the 'o's and 'e's, or a slight variation in the thickness of certain lines can create an entirely unique look.

Look for the defining characteristics of your design, such as the proportions, angles, thicknesses and curves. Make them simple and apply them to every letter and symbol.

SPECIAL FONTS

If your plan is to create a particular brand identity with your font, don't be in a hurry to start your design. Think it through first and work out exactly what you're trying to say with the typeface.

It may even be that you come to the conclusion that you'll only ever want to use it for the words contained in your logo. In which case, you might well decide not to design it as a font at all, but simply to design the logo.

An example of a font with a very specific use is that of the typeface used to introduce the *Star Wars* films. The introductory storyline which scrolls away from the camera at the opening of the film uses a very simple bold font with no embellishments. It's an iconic, instantly recognisable font — and it is never used elsewhere.

USING FONTSTRUCT

Fontstruct is a free online font design tool. Simply go to <http://fontstruct.fontshop.com> and register to start designing your own fonts, which are constructed one letter at a time on a grid. A simple set of drawing tools allows you to add or remove a selection of shapes however you like.

The main Fontstruct screen presents a grid with a blue horizontal line through the middle.

This line represents the baseline for your font — the line on which all the letters sit, with only the descending strokes below it.

At the bottom of the screen, you can select which letter you want to work on. Any letters that you've already created appear as dark grey. By default, your font is set to the basic Latin character set, but you can work with other languages if you wish. Simply select them from the drop-down list at the bottom left.

The left-hand side of the screen is given over to a palette of shapes from which to construct your letters. A floating palette provides basic draw and erase tools to add and remove shapes.

BUILDING YOUR FONT

Fontstruct will allow you to edit your letter shapes as much as you like — and there's a full range of upper and lower case letters, punctuation and symbols to play around with.

It's usually best to start off by building up your letters simply using the solid block shape. This allows you to create a basic form for all your upper and lower case letters before you start refining the images (or glyphs). This allows you to make sure that all your letters work together and give the look you're after before you start embellishing them.

Once you've got the basic shape, you can start to refine it by adding curves, diagonals and other shaping blocks. Simply click on a shape on the left-hand side of the screen, then click to add curved edges, serifs and detail.

This is the time-consuming part of the font design process, and it's the stage at which most of the typeface's individual character is added. It's a good idea to make sure that you've got the basic shapes right before you start

DO THIS...

As you construct a font, your ideas are bound to develop. You'll become more confident with the style and your concept will become stronger and more defined. This can mean that the last letters you design are more confident and give a better indication of the style you're going for than the first characters you create. Look out for this and, if you need to, go back and revise the initial designs. In font design, consistency is everything.

CHECK YOUR STYLE



Your font can be any style that you want, but make sure that you keep its design consistent.



When you've finished designing a few letters, use Fontstruct to preview how the characters look.

embellishing the characters.

Typically, the first few letters are the most difficult. It's on these letters that you develop the style that you're going to use. Define the character of the shapes that will make up your font and work out the thickness and placing of the straight lines, the structure of the curves, the proportions of the letters and the angles of the diagonals. Once you've built a few letters, it'll become very obvious what shapes need to go where on each character and how letters complement each other.

When designing, you can easily end up accidentally creating letters of different sizes. To combat this, the Advanced/View menu offers the Extra Guides option, which displays two more blue lines on the grid to help you keep your letters to scale. The horizontal line allows you to set a standard height for your characters and the vertical one allows you to set a standard width. Another useful setting is the Adjacent Characters option, which displays grey versions of the letters adjacent to the character that you're working on, helping you to keep the style consistent.

TESTING YOUR TYPEFACE

Once you're happy with a few letters, select the preview tab. The letters you've designed are printed in order in the bottom panel, and in the top panel you can type to see how your font works in reality. Sliders at the right of the screen allow you to see your typeface displayed in different point sizes.

Now's the time to take a good hard look at your font. You can type with it and you can see every character you've constructed, so you've an opportunity to see whether they all work

DO THIS...

When you've finished designing your font, print it out at a range of sizes. It's a very different experience to read your font from a piece of paper than it is to read it from a PC screen. The standard practice is to use a Latin paragraph dubbed 'lorem ipsum' (you can download a copy at www.lipsum.com). This is because if you use a text written in English, you'll automatically start to read it. Using this Latin text (which is actually a treatise on ethics) lets you look at the type and layout instead of the words.

together and look as though they're part of the same design.

Look carefully. Do any of your letters stick out? Are any of the shapes inconsistent? Are any of the characters hard to read?

If you answer yes to any of these questions, simply click the 'go back' button and carry on working on your font.

DOWNLOAD AND DEPLOY

There's a wide range of building blocks available in Fontstruct, but it's by no means comprehensive. There are some looks you just can't create with the application. If you want to build fonts with very fine lines, scrolls and curves, or if you want to add very complex shapes, you're probably better off working with a professional font design package such as Fontlab Studio or Fontographer.

The cost of these packages is quite high but they will allow you to design letters very much as a vector illustration package allows you to design shapes.

PRINT IT OUT

EXPLAINING SERIFS

A serif is a decorative detail at the end of a stroke — usually a very small line or curved shape — that finishes off the ends of a letter. Serifs are supposed to make big blocks of text easier to read, so newspapers and most books are printed with serif fonts (Times New Roman being the most popular). A sans-serif (without serif) font looks cleaner and simpler, and you'll often find sans-serif fonts (such as Arial) used in shorter text items.

RESOURCES

If you don't want to design your own fonts, you can always add to your computer's list of typefaces by downloading ready-made ones. Take a look at www.searchfreefonts.com for new fonts ready to download.



Although Fontstruct lets you see your font in action on your PC's screen, typefaces often look very different when you see them on paper.

A TALE OF TWO FONTS

When you're designing a new typeface, the key is to create something truly original, right? If that's the case, why do so many fonts look very similar? The answer is to do with making a font successful commercially. Have you ever heard of a font called Helvetica? It was the most popular typeface on the planet in the '50s, '60s and '70s. Its simple shapes and readability made it the font of choice for anything that wanted to look modern and progressive.

However, Helvetica's success was also its downfall. When Microsoft launched Windows, they wanted a clear, readable and modern typeface to ship with it — and Helvetica was the perfect choice, except for one thing: it would have cost money to licence, and Microsoft weren't willing to pay. Instead, they shipped Windows with Arial — a close copy of Helvetica knocked up in what most typographers agree was a bit of a low-grade bodge. As a result, Arial is the world's typeface of choice, while Helvetica is fast disappearing into obscurity. www.digitalscribe.com



Get the web's best apps

Customise online services and run them direct from your desktop with Mozilla Prism, writes *Karl Hodge*.

REQUIREMENTS

● FIREFOX 3

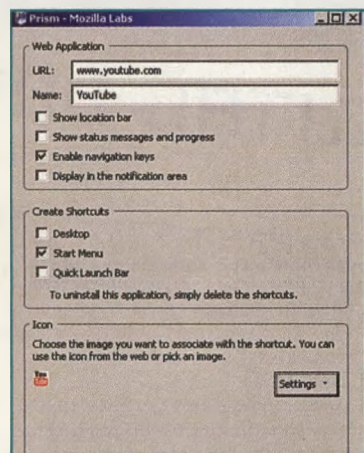
Available from www.getfirefox.com or www.mozilla.com.

● PRISM (STANDALONE)

Available from <http://people.mozilla.com/~mflinkle/prism/>.

● PRISM EXTENSION FOR FIREFOX

Available from <https://addons.mozilla.org/en-US/firefox/addon/6665>.



Prism web apps can be configured through the app's launch dialog.

Prism — the 'distraction-free browser' currently bubbling away in the Mozilla Labs — takes your favourite web sites and turns them into configurable desktop programs. As the line between desktop and online applications begins to blur, Prism gives you a way to create individual shortcuts to the web services you use habitually. Instead of opening in a browser window with back and forward buttons, an address bar and bookmarks, applications have their own frill-free window.

What's more, you can change the look and layout of that window to suit your needs. The only real restriction is that you still have to go online to use them.

MAKING APPLICATIONS

The pre-release version of Prism (designated 0.9) is available for Mac, Linux and Windows in two versions: a standalone installer and a version that works as an add-on for Firefox. We used release candidate 2 for the practical parts of this article, running on Windows XP.

Using Prism to create apps from web sites is very easy. Launch Prism and a dialog prompts you to enter the URL for the site you want to convert. Alternatively, use the Firefox add-on version, navigate to a site you want to run in Prism then choose 'Convert Website to Application' from the 'Tools' menu. This time the URL is automatically filled in for you.

Let's try this with online image editor Splashup (www.splashup.com). Launch Prism and enter the URL 'www.splashup.com'. In the Name field type 'Splashup Photo Editor'. Immediately below that you have the option to include various browser elements. In this case we'll leave all of them unticked except for 'Enable Navigation Keys'. That way, if you get lost in the application you can still go backwards and forwards through the 'site'.

You can also ask Prism to create a shortcut to your application. This is a good idea — as we'll see in a minute. Tick the 'Desktop' box for now.

Click 'OK' and take a look at your desktop. You should see a new icon labelled 'Splashup Photo Editor'. Give it a double-click and the Splashup site is launched in Prism. There are some further menu-based tweaks you can make to the configuration. Click the 'Commands' icon at the bottom right of the window. The 'Tools' menu enables you to make Firefox add-ons available to Prism applications, while 'Print' and 'Page Setup' are self-explanatory.

Try clicking the 'Jump straight in' link in the Splashup window. The application launches in a new Prism window — not a new Firefox window. Prism renders pages and parses code just like Firefox, but without the frills. Now, let's take a closer look under the bonnet.

CONFIGURATION FILES

Return to the desktop icon Prism created for your application. Right-click on it and choose 'Properties'. You'll see a very long shortcut path for the application. This gives us some crucial clues as to how Prism works. The shortcut invokes Prism, which in turn sends a call to configuration data stored in a special 'WebApps' folder. Start Windows Explorer and navigate to the folder 'WebApps'. You should find a directory named 'splashup.photo.editor@prism.app' within. Open it and you'll find a couple of initialisation files.

If you open the file 'webapp.ini' in any text editor, you'll see a set of simple configuration parameters analogous to the choices you made earlier. There are a couple that aren't available through Prism's menu interface too — like the 'sidebar' attribute. Any of the parameters here can be changed. The binary parameters can be set to true or false, and the text strings replaced by anything you choose.

Here's something more intriguing. Select all the files in the 'splashup' folder and hold down Ctrl, then click and



AOL's bespoke AIR application is a compact desktop version of the online behemoth's video site.

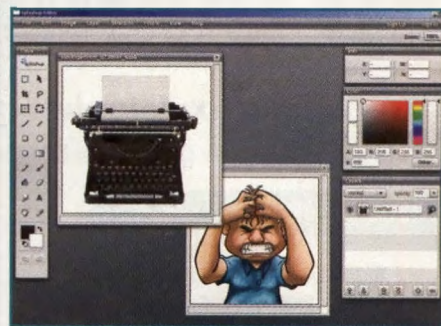
SPOTLIGHT ON... ADOBE AIR

There has been some controversy caused by bloggers in the Adobe and Mozilla camps snarking at each other about the relative capabilities of AIR and Prism. The truth is, they're really quite similar. Adobe AIR runs HTML, CSS, Flash and other web technologies — just like Prism. Its core is WebKit, the open-source browser engine used in Apple's Safari. Prism's core is Gecko — Firefox's browser

engine. The major difference is that, while Prism's web app creation is aimed at and accessible to ordinary web users, AIR authoring is solidly a developer activity. AIR applications are custom-built for AIR, using a library of interface frameworks and an SDK that enables runtime debugging before deployment. You can find some very slick examples at www.adobe.com/air/.



Using Prism you can get Google Mail running direct from your desktop.



This shows the online Photoshop clone Splashup running in Prism. It can be launched from a shortcut direct from your desktop.

drag a copy of those files to your desktop.

With the copied files still selected, right-click and choose 'Send to > Compressed (zipped) Folder'. This creates a ZIP file on your desktop. Select and rename the file to 'splashup.webapp'. The file's icon changes to show that it's now associated with Prism.

You've just created a 'webapp bundle' — a portable application version of a web site converted for Prism. Double-click on the freshly minted icon and Splashup will launch in a new window.

ADDING STYLES

This webapp bundle is very bare. Prism supports further configuration files that can be used to customise converted sites into personal applications. CSS styles can be amended using a file named webapp.css and JavaScript behaviours added with webapp.js.

Here's an example. Go to YouTube (www.youtube.com) and turn it into a Prism webapp. Next, open a text editor and type in the following code:

```
body{font-family:Times New Roman, serif;}
```

Save the file as 'webapp.css'.

Navigate to 'Documents and Settings > username > Application Data' and find the 'WebApps' folder again, wherein you'll discover the YouTube folder for the site you converted

earlier. Open it, then drag and drop the file 'webapp.css' to the folder.

Now, launch the YouTube Prism webapp and all the text should now be formatted with Times New Roman rather than Arial, the usual default font. To find further CSS changes you could make, install the Web Developer toolbar add-on in Firefox and select the 'Edit CSS' option. This gives you access to the CSS file for the site you're browsing, enabling you to pinpoint which classes you can edit and override using webapp.css in a Prism bundle.

JAVASCRIPT FUNCTIONALITY

Now that we're editing bundle elements, let's backtrack a bit and return to the 'webapp.ini' file that we looked at earlier. This time, we're going to edit a configuration file to create a mash-up of two applications — using an idea first mooted by Prism developer Mark Finkle. This time we'll start with a bundle for Gmail. Make a gmail.webapp bundle as per the above instructions. Next, drag a copy to your local machine and rename it 'gmail.zip', then extract the contents.

Open the extracted folder and find the file 'webapp.ini'. Set the sidebar parameter to 'true' and save the file.

Start a new document in a text editor and add the following code:

```
function startup() {
```

```
host.sidebar.add("Chat", "http://talkgadget.google.com/talkgadget/popout");
host.sidebar.visible = true;
}
```

Save this code as 'webapp.js' in the same folder. This snippet of JavaScript passes the content of a URL direct to Prism's sidebar.

This has the same result as defining a URL in the main configuration file webapp.ini, except that we're targeting an object within the host application rather than the main window. The URL we pass could have been anything — an alternative navigation list, another web site or application. In this case, it's Google Chat.

To finish off the web bundle, select all the files in the folder and right-click, choosing 'Send To > Compressed (zipped) Folder'. Rename the ZIP file 'gmailchat.webapp'. Double-clicking on the newly created application you'll be prompted to log in to a Prism-created mash-up of Gmail and Google Chat.

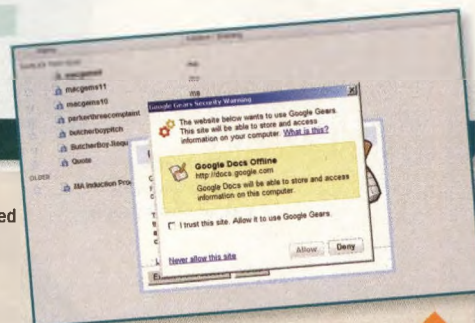
Prism is a simple and powerful method of bridging the gap between desktop and web applications. With these tips and tweaks, you can bundle your own versions of popular web services either for your own use or for distribution online. **ETC**

SPOTLIGHT ON...

GOOGLE GEARS

Google Gears is another technology aimed at bringing web services to the desktop. Unlike AIR and Prism though, Gears works online using a 'LocalServer' module to cache and serve applications direct from your computer to your browser. There's also a Database module and a 'WorkerPool' module that takes over the execution of JavaScript from your browser, increasing compatibility and speed with

Gears authored apps. While Prism can be used to encapsulate and run any website and AIR is designed for standalone applications, Gears can be used to extend the functionality of sites online, using local database information and running JavaScript in Gear's WorkPool. Gears isn't quite ready for primetime (it's currently at version 0.3) but you'll find Gears functionality on sites like MySpace and Digg.



Google Gears functionality is built into Google Docs, allowing the site to save your work locally.



3D photos without glasses

Mike Bedford explains how you can take and view photos that jump off the page with no special glasses required.

REQUIREMENTS

A DIGITAL CAMERA

You don't need anything special — you can take 3D photographs with any digital camera.

A TRIPOD

For the best results you'll need a tripod, although some people claim to have managed without.

HARDWARE

If you don't already own a tripod and want to make your own, you'll need chipboard and screws, plus various second-hand photo accessories that you'll be able to pick up very cheaply from a good photographic shop.

SUPERFLIP!

You'll need this software for making lenticular images: request a free copy at www.vuethru.com.

LENTICULAR SHEETS

For lenticular images, you'll need a supply of lenticular sheets. These only cost around \$2 each, but you will need to buy them in bulk from www.vuethru.com.

Back in *APC* June (page 106) we showed how to convert a stereo pair of images into an anaglyph — a picture which comes alive when viewed through a set of red-green glasses. Now we'll build on those foundations and show you how to prepare stereo pairs that don't need special viewing aids, using a technique called 'free viewing'.

These sorts of images are captured from different viewpoints, so they contain the information that our brains need to perceive depth. However, because this only works with small images, we'll also describe how you can make lenticular 3D photographs that you can see in all their glory at any size and without having to master the knack of free-viewing.

We'll also show you how to turn 3D computer models into the 3D images popularised by the Magic Eye books a few years ago.

TAKE THE PHOTOGRAPHS

To appreciate depth in an image we have to see it from two viewpoints, one slightly to the right of the other, so the first job in creating a 3D photograph is to take two photographs. Normally they'll be taken from 70mm apart — the distance between our eyes — but for an exaggerated effect, or for distant scenes, this

can be increased. Similarly, for macro photos, you'd have to reduce the separation.

Some people take stereo pairs with no special aids by moving the camera's optical viewfinder from one eye to the other between shots. You could try this, but you will probably struggle to get good effects since there's no guarantee that the camera will be at exactly the same height or pointing in the same direction between shots. It's better to use a slide bracket mounted on a tripod, as shown in the photograph [below left].

You can make one by screwing together four pieces of chipboard and attaching a tripod-mounting socket to the bottom, remembering that it should have an internal width equal to the width of your camera plus 70mm. Photographic shops often have boxes of second-hand accessories, and if you rummage through these you'll probably find something (like a flash bracket) that you can take apart to get hold of a tripod-mounting socket.

To use the bracket, attach it to a tripod, making sure it's level, and place your camera snugly in the back left-hand corner. Take a photo. Now slide the camera, making sure it stays in contact with the back of the bracket, until it stops in the right-hand corner, and take another. This method only works if the scene has nothing that can move between the two exposures. For a more universal solution, see the 'Spotlight on... Using two cameras' (above right on the next page).

OTHER SOURCES OF STEREO PAIRS

In addition to taking stereo pairs with your digital camera, you can also create them in software. VRML 3D models are a good way of generating them — just change the viewpoint between capturing a couple of screenshots. 3D landscape software like VistaPro and Bryce are also a good source of stereo pairs. Mathematical software for generating polyhedra often presents virtual 3D models on screen and allows you to alter the viewpoint. Some fractal packages can even render the Mandelbrot Set as a 3D landscape and offer a choice of viewpoints.

FREE VIEWING

The easiest way to present a stereo pair is to format them for free viewing in a photo manipulation package. Place the two images side by side, the left-hand image on the left and the right-hand image on the right, with a small gap between them.

A slide bracket helps you to take a stereo pair of photographs.



SPOTLIGHT ON...

USING TWO CAMERAS

If you're serious about 3D photography, why not use a pair of cheap cameras to photograph moving objects. All you need to do is attach them side by side with the lenses 70mm apart, make sure that the settings (including the zoom level) on both cameras are identical and press both shutter releases at the same time, ideally using a remote control. You can make a bracket to mount two

cameras side by side by using a couple of flash brackets that you can probably pick up cheap from a photographic shop. Take one apart so that you have a spare tripod screw. Now insert this into the second so that you have a bracket with two sockets. Finally, remove its flash shoe. You now have a bracket for harnessing any pair of identical cameras with tripod sockets.



Make a bracket for two cameras from two cheap flash brackets.

Now you can view them either on screen or as a print. You'll find that there's a limit to how large you can make them, so start small — perhaps with each image 40mm wide — and work up from there.

To view, start with the print or screen 300mm away. Allow your eyes to relax so that you start to see everything in duplicate. Continue until one of the left-hand images is superimposed on one of the right-hand images. You'll now be seeing three images — a left-hand image, a right-hand image and the superimposed images — but they'll be blurred. Try to get them back into focus without losing registration. As soon as you manage to do this, the centre image of the three will appear in full 3D.

LENTICULAR IMAGES

Any 3D viewing technique means ensuring that the left eye sees only the left-hand image of the stereo pair and the right eye sees only the right-hand image. The lenticular technique involves

splitting the two images up into thin vertical strips, typically a 60th of an inch wide, and reassembling them alternatively (left-right-left-right and so on). The print then has a lenticular sheet placed in front of it. A lenticular sheet is a sheet of transparent plastic that's formed into lenticules; that is, thin vertical lenses at the same pitch that the two images are interlaced. The effect of the lenticules is to direct the alternate strips of the image at different angles so that the left eye sees only the strips that make up the left image and the right eye the strips of the right image.

USING SUPERFLIP!

SuperFlip! generates interlaced images for lenticular viewing. It's easy to use, but there are a few things you need to bear in mind. First, you'll only get acceptable results with an inkjet printer; laser printers use too much dithering. Second, even though suppliers specify the pitch of their lenticular sheets (we recommend using 60dpi

sheets), you still need to test it to determine the true optical pitch, which will vary with the type of paper and printer. See 'Do this... Test Your Lenticular Sheet' (below) for more details.

To generate the lenticular image, click on the 'Add' button in SuperFlip! and select the left-hand image. It will be displayed in the list of files as number 1. Do the same for the right-hand image, which will then be shown as file 2. Now click on the 'Process' button and enter the lenticular pitch you've measured as Line Screen (LPI) and your required image size. Decline the option of enhancing the image on the next dialog box. Finally, enter a filename when requested and, when SuperFlip! has finished, you can print it out normally. To view your creation in 3D, place a lenticular sheet on top of it with the lenticules parallel to the stripes in the image and adjust its alignment. You can clamp the print and the lenticular sheet together in a frame, but for a more permanent result, you'll need to bond them together.

DO THIS...

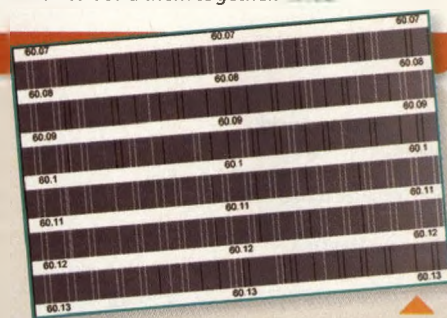
TEST YOUR LENTICULAR SHEET

The lenticular pitch won't be exactly what the supplier specifies and it varies with the type of paper and printer, so you need to test it. In SuperFlip!, select 'Print Line Screen Test' from the 'Utilities' menu. Enter

60.07 (assuming you're using 60 LPI sheet) as the 'Starting Lines per Inch', 0.01 LPI as the 'Print Accuracy' and 'Just Doublet' as the 'Test Strip Options' before clicking on 'Print'. A page will be printed with 11 strips of black

lines spaced at distances varying from 60.07 to 60.17 inches.

Place this on a table with the longest edge closest to you and put a lenticular sheet on top with the lenticules running horizontally, moving it as necessary to view each of the strips. Choose the strip (probably around 60.12) which at one angle appears solid black and at another solid pale grey. This is the pitch that you'll use when interlacing images.



Use the test strip to measure the pitch of your lenticular sheet.

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Catch intruders

Secure your Linux box by locking it down and posting a guard to watch for intruders, writes *Graham Morrison*.

REQUIREMENTS

● A LINUX MACHINE

The machine should be running connected services such as SSH, FTP, Apache or Postfix. We've used the latest release of Ubuntu for our examples, and either the Desktop or Server versions will work.

There's no doubt in the computing industry that Linux is a secure operating system. It's used by thousands of internet servers and is the backbone behind the online presence of internet giants like Google and Amazon. However, just like almost every other piece of technology, it does have some weak points. Millions of lines of code are churned through the kernel every second and it only takes a single programming mistake to open a door into the operating system. If that line of code happens to face the internet, that's a backdoor to your server.

This is why most modern Linux distros avoid installing a single internet service on your machine. It wasn't so long ago that your distro would install everything from telnet and FTP to SSH and Apache. Each one of those services is a possible point of failure, which is why you'll seldom find any installed by default now. If you want to run an SSH server, you'll need to install it yourself and start paying attention to any security updates released for your chosen distro. Ubuntu users should run the automatic updates facility, which will download and install security patches as they become available.

THE EYES HAVE IT

Patches are often released quicker and more often for Linux systems than they are for proprietary products. This is because anyone can take a look at the code — and thousands of developers regularly do. This 'many eyes' approach, which was eschewed by Linus Torvalds, means that problems like backdoors

are usually found quickly. It also means that fixes are released just as quickly.

There's been a very vocal debate on the Linux kernel mailing list recently, with developers arguing about whether security bugs that are fixed should be formally announced and documented.

Torvalds believes that making a big song and dance about security patches attracts the attention of miscreants like bees to honey. Others believe that anything but complete openness goes against the philosophy of Free Software. The debate is still burning, but while the overlords of the Linux kernel are deciding which way to swing, there's a great deal you can do to protect your system, even if an internet-facing service is compromised in some way.

WATCHING FOR TRAPS WITH TRIPWIRE

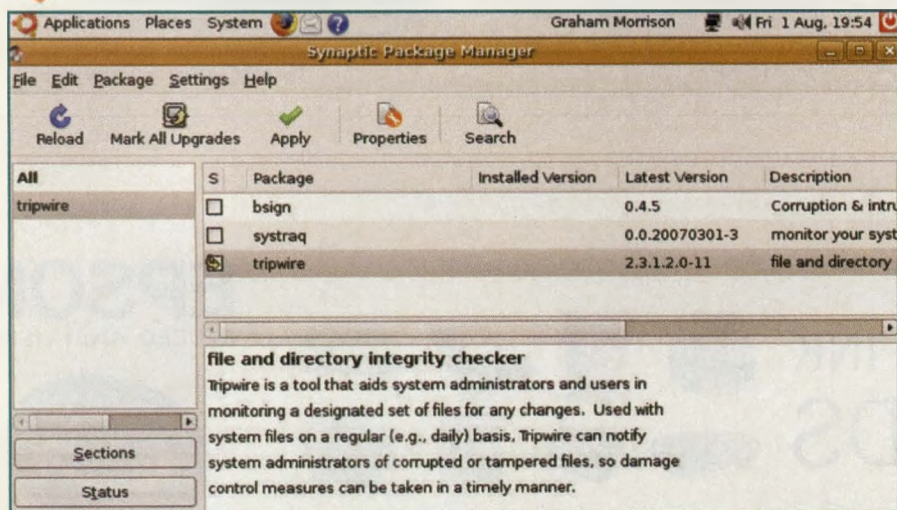
Tripwire generates checksums from all the essential binaries that are running on your system. Every file has a completely unique checksum. If a single bit of data changes in the file, the checksum it generates will be completely different. These checksums can't be cracked or duplicated because they rely on a tried and tested method of encryption. Using this database of checksums, Tripwire will periodically recheck the value of each binary file in its database. If any file has changed, the wire is tripped and an alarm is signalled.

This system is incredibly effective, because the first thing a hacker usually does when they gain access to your system is replace important system files with their own version. This is known as a 'rootkit', and it means that the hacker can always access your system — even after you locate and update the original 'backdoor' security problem.

There are various tools that look for the tell-tale signature of a rootkit installation, but Tripwire pre-empts these tools by catching changes to the file system — hopefully before the rootkit can even be used. For this reason, you can find Tripwire in the package repository of nearly every Linux distribution we can think of. Just search for it and install. Tripwire defence has been so successful that a proprietary company has been launched on the back of the original Tripwire product; both are confusingly called Tripwire. Thankfully, however, the open-source version of the software is still popular, despite the fact that, like all Linux security tools, it takes a considerable effort to get it working.

Most of that effort is to do with editing arcane configuration files. Choosing Ubuntu or

Tripwire is a standard package for many Linux distros, and even when it's not installed by default, it's only a click away in your Package Manager.




```

root@graham-vm:~# twadmin -m G -S /etc/tripwire/site.key

(When selecting a passphrase, keep in mind that good passphrases
have upper and lower case letters, digits and punctuation marks
at least 8 characters in length.)

Enter the site keyfile
Verify the site keyfile
Generating key (this may take a while)
root@graham-vm:~#

```

Tripwire's policy configuration file points to all the directories and files you want to provide cover for. Feel free to trim it to fit your requirements.

```

# Critical System Boot Files
# These files are critical to a correct system boot.
#

rulename = "Critical system boot files",
severity = $(SIG_HI)

/boot -> $(SEC_CRIT) ;
/lib/modules -> $(SEC_CRIT) ;

```

As the old saying goes, your data is only as secure as your password. If you're going to all this trouble to protect your files, choose a good one.

Debian can help with this, as both of these distributions include a quick set-up wizard when you install the packages. We've used Ubuntu Hardy Heron in the example configuration below. We've also provided the manual commands for configuration if you're using a different distribution.

Make sure everything that needs to be installed is installed. If you add more packages after the Tripwire installation, you'll have to go through a rather convoluted reconfiguration routine. For this reason, it's more straightforward to install Tripwire after you've configured and set up the server exactly as you need it.

CONFIGURATION

After installing the Tripwire packages, you'll be presented with the Tripwire configuration wizard. The first question asks whether you want to create or use your site passkey. This is the unique encryption key that's used to generate the checksum information for your files, and Tripwire uses two — one for files that are only going to be used on the installation machine (such as the Tripwire configuration files

themselves), and another for files that may be accessed and used on other machines across a network. The next page of the wizard will ask you for these.

However, there is a caveat. If someone else has a copy of the same keys, they can potentially create files that appear authentic. There's a slight security risk with keys generated by the Debian installer, so if you're in any doubt about the security of your system, you should generate the keys manually (see the next paragraph for how to do this). Otherwise, continue with the next page of the wizard, enter long phrases that you can easily remember for both configuration keys and let the set-up wizard generate the configuration file.

To generate both the local and server keys manually, open a terminal and switch to using the System Administrator's account. Type the following (Ubuntu users should precede both lines with 'sudo'):

```
twadmin -m G -S /etc/Tripwire/site.key
```

READ-ONLY MEDIA

If you're paranoid about the security of your box, you should try to make sure that you place the Tripwire binaries on read-only media, such as a USB storage device with a physical 'write-only' switch, or even a floppy disk — if you can remember what they are, that is. This means that the essential files stored on those devices can never be overwritten unless the hacker has physical access to your machine.

```
twadmin -m G -L /etc/Tripwire/hostname-local.key
```

You should replace 'hostname' in the second command with your machine's hostname. In Ubuntu, this is the word that comes after the 'username@' symbol in the command line. In both cases, you'll be asked for a passphrase to generate the key. You need to use these keys to encrypt the two configuration files used by Tripwire, both of which reside in the '/etc/Tripwire' directory in plain text — which is why they have the '.txt' extension. Encrypt the first by typing the following command:

```
cd /etc/Tripwire
```

```
twadmin -m F -S site.key twcfg.txt Enter pass phrase:
```

As you can see in the above commands, you will be asked for your passkey, and you will need to enter the passphrase that you used to generate the server-side key earlier. The second configuration file that we need to encrypt is called 'twpol.txt'. This is Tripwire's policy file, and it contains all of the policies and rules used by Tripwire to govern its file protection. Debian/Ubuntu creates a default set of policies that should be more than adequate for most installations. If you take a look at the policies themselves, you will see small sections of code that look like the example given below:

SPOTLIGHT ON...

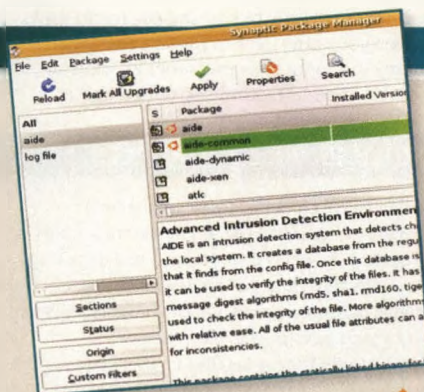
DETECTION ALTERNATIVES

Tripwire isn't the only intrusion detection system available for Linux. The best known of the others is called AIDE and it uses the same checksum principle as Tripwire. It can be installed through your distro's Package Manager, which should include a working configuration file so that you don't need to worry about creating your own policies. If you have to create your own, AIDE uses a similar syntax to Tripwire. For example, you type 'aide --init' to create the initial file system snapshot, and 'aide --check-v2' to check your system against any changes in the initial snapshot. AIDE is easier to use and maintain than Tripwire, but not quite as immune to tampering.

Another intrusion detection system available for

Linux is LIDS — the imaginatively named Linux Intrusion Detection System. This is a series of patches for older Linux kernels that implements Mandatory Access control, which is a way of restricting applications and tools to the data and file system locations they need, and nothing more.

If the worst happens and a hacker takes over one of these tools, there's very little they'll be able to do. LIDS has been superseded by SELinux and AppArmor, which are installed and running on most modern Linux distros. Both offer their own access control restrictions that can prohibit tools and apps from straying into dangerous territory. The only problem is that they're both difficult to use.



AIDE offers similar security features to Tripwire but is easier to configure and run.



The final report is easy to understand, but you may need to fine-tune your policy file so that there aren't too many false positives.

```
{
  rulename = "Critical system boot files",
  severity = $(SIG_HI)
}
{
  /boot
  /lib/modules
}
```

The syntax above is relatively straightforward, if a little verbose. The section above is protecting critical system boot files, as explained in the rule name. You can see which directories specifically in the lower section. The boot directory contains both Grub and the Linux boot loader.

A rootkit or trojan that changes any files here could cause serious damage. The '/lib/modules' directory contains all the kernel drivers for your system. A subtle change to the modules here could cause all kinds of subtle and not so subtle havoc. For this reason, both directories have been given a severity of SIG_HI, which is the strongest possible signal from Tripwire that something is wrong.

Earlier on in the configuration file, SIG_HI is given a point score of 100. If you have directories and files that aren't part of a standard Ubuntu installation, and these need to be protected, then you'll need to create your own policies for those locations. After you've finished looking at the policy file, it's time to encrypt it as we did the first one. Just type the following: 'twadmin -m P twpol.txt'. You will be asked for your passphrase again before the encrypted file can be generated. And that's all the configuration you need. The next step is to type 'Tripwire --init' to start building the database from the locations specified in your configuration file. The time this takes is dependent on how many directories and files need to be scanned, but expect to wait long enough for the kettle to boil and the tea to stew.

When you come back to the screen, you'll probably see some error messages as Tripwire complains about directories specified in the

Rule Name	Severity Level	Added	Removed	Modified
Invariant Directories	66	0	0	0
• Tripwire Data Files	100	1	0	0
Other binaries	66	0	0	0
Tripwire Binaries	100	0	0	0
Other libraries	66	0	0	0
Root file-system executables	100	0	0	0
System boot changes	100	0	0	0
Root file-system libraries (/lib)	100	0	0	0
Critical system boot files	100	0	0	0
• Other configuration files (/etc)	66	0	0	2
Boot Scripts	100	0	0	0
• Security Control	66	0	0	1

configuration file that don't exist. You can safely ignore these. Tripwire is now ready to defend your system.

Testing your current file system against the copy held in the Tripwire database is as simple as typing 'Tripwire --check'. After a few minutes, Tripwire will start to report any detected changes. As an experiment, try editing one of the files covered by your policy.

You could add a new group, for example, or change a user's password. Either of these actions will change a configuration file, making it different from the one held in the Tripwire database. The generated report will include a useful table, so that you can see exactly what has changed and what kind of severity the issue has raised. Below the table, the output goes into greater detail. Here's a snippet from Tripwire's output if you change a password:

```
Rule Name: Security Control (/etc/shadow)
Severity Level: 66
Modified:
"/etc/shadow"
```

You can see the rule name under which the password files fall (shadow is the encrypted file used to store passwords), and you can also see the severity for the issue. At a security level of 66,

it's less severe than a change detected in the boot files and modules directories, but it's still notable. Because the output from Tripwire is quite detailed, you can decide for yourself the likelihood of a compromised system. The output is stored in an encrypted form in the '/var/lib/Tripwire/report' directory, and if you take a look at it, you can see a file for every report you've run.

If you want to make any discovered changes permanent and flag them as acceptable, type 'Tripwire --update -r hostname-report.twr', inserting the name of the report you want to edit instead of our placeholder. This will decrypt the report's contents into a Vim editing session (as set in one of the configuration files). Instructions are embedded within the file, but you generally just need to remove an 'x' from the files you want to update.

Quitting the editor will run the scan again, with your changes added. With everything running correctly, you might want to schedule a regular time for Tripwire checks. Running a check once every 24 hours is recommended, but this all depends on the vulnerability of your system. If you know that your system has security issues, try running Tripwire once every few hours. As long as you check the reports, you can be completely certain that your system hasn't been compromised. **ETC**

SPOTLIGHT ON... LOG FILES

You can do a lot to protect your system from intruders without installing any new software. This is all thanks to humble and universally underused log files. Linux must be one of the few operating systems (other than Unix) that can document almost every important change to the system.

You can find all the log files for your system nestled in the '/var/log/' directory. That location is full of information about the way your system is running, the connections being made to it

and the attempts hackers are making to try and gain access. Surprisingly, that last one is amazingly common.

There won't be a single server on the internet that isn't constantly bombarded by port scanners and password checkers. Take a look in your 'auth.log' file if you don't believe us. This is where all your user's connections are logged – locally and remotely. It contains the number of password attempts that people try, and in the case of a

password scanner, it will show the username they're trying to go for as well as the IP address of the person/computer trying to make the connection. The 'messages' file is the place to look if you want to see the day-to-day running messages of your machine, which also detail any hardware problems.

It's usually the first place to check if a CD-ROM or USB storage device isn't mounting, while 'dmesg' contains all the boot information that flies by too quickly when you reboot your machine.



Coding with Google apps

Nick Veitch shows how to build a graphical web application. Use Google App Engine to create and share your own coding masterpiece.

REQUIREMENTS

● A GOOGLE ACCOUNT

You must have a Google account to use the App Engine servers.

● APP ENGINE SDK

Available as a download from <http://code.google.com/appengine/downloads.html>.

● PYTHON 2.5

Grab the Windows installer from www.python.org.

For the moment, everyone's got to stick with the same limits. Commercial versions will be available at some undetermined point in the future.

Everything you do on your desktop, you can now do online. Well, nearly. The truth is that many web applications are so compellingly good and useable that you forget that they're not running on your PC. Gmail now seems like the way one should access emails and use instant messaging. However, there isn't an application for absolutely everything — at least, not yet. Which is where you come in. By the end of this tutorial, you will have created and deployed your very own web application that other people can access and use online. It won't cost you a bean, and it could open up new avenues for your coding skills.

The easiest way to get your web app active online is to use the recently launched Google App Engine (GAE) service. Essentially, Google has a bank of servers that are sitting idle a lot of the time. Using its own application engine code (pretty much the same service that runs Google maps and so on), it can serve up your web application on little slices of their servers.

The service is free for now, but there are restrictions on processor time and bandwidth use as you might expect. However, all you really need is contained in one download. Grab the SDK, make sure that you have Python installed, and you are ready to create a web app. It doesn't make much difference what platform you choose to develop your application on. Linux may have a slight advantage due to the easy integration of Python, but the App Engine code will run on any OS that has Python 2.5 installed.

There are two main scripts included with the SDK: 'appcfg.py' and 'dev_appserver.py'. The

first is used to configure and upload your files, and the second is the actual application server, albeit a locally running one. With Python installed and ready to go, unpack the App Engine SDK files. Just leave them in a convenient directory where you can get to them easily. The first thing to do is create a directory to store the files in. It's important that the application has its own directory, as later on we will be using scripts to deploy the entire contents.

With a directory created, we need to make some files. The most important one is a file that must be called 'app.yaml'. This YAML file is like a configuration file used by the configuring script and the App Engine code to determine what files are involved in the project and how they are used. The syntax and layout of the file is pretty simple. The header contains information giving the name of the application and version information:

```
application: imagemunger
version: 1
runtime: python
api_version: 1
```

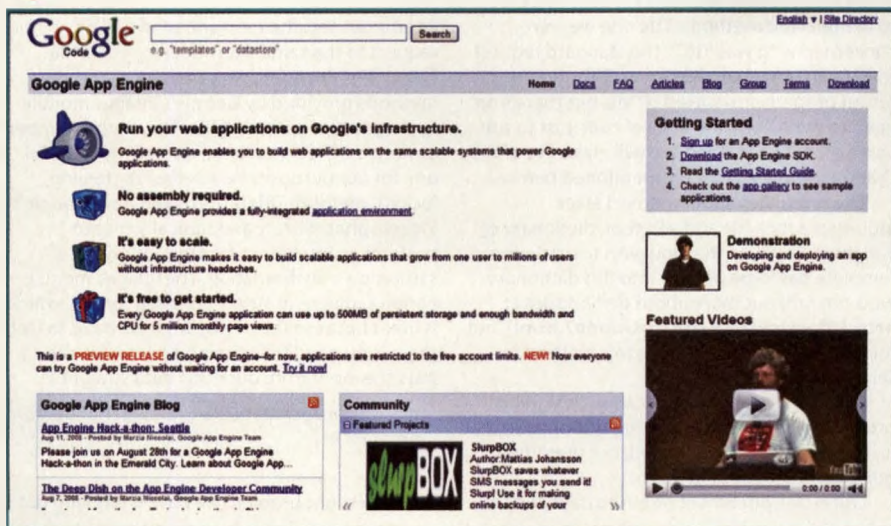
The application name is important when you come to finish your web app. That's because when you host the application on Google's servers, it will be the unique name used by the application to identify it (and form part of the URL). The version is just the version information for the file, and the runtime is obviously Python — because that's currently the only language that GAE supports. The API version is also currently 1. So that's the easy part.

The next bit of the file determines how HTTP requests for data are handled, and begins with a 'handlers:' declaration. For now, all we have to worry about is URLs. Each URL line begins with the path to match:

```
- url: /
```

This indicates the URL, followed by nothing — ie. the default URL. The next line contains the handler we want to pass that to. As we're creating Python-based web apps that will be a Python script, we identify it as: 'script: main.py'.

If you want to include any graphics, these can be identified as static files. The following code uses some pattern matching to make sure that requests for any web graphic result in the image file being sent:





You're not restricted to the Google look and feel when making applications using its technology.

```
- url: /(.*(gif|png|jpg))
static_files: static/1
upload: static/(.*(gif|png|jpg))
```

With the YAML file out of the way, it only remains to add the actual code that we will be using. Even if you have never coded in Python before, it's pretty easy to pick up what is going on. If you have previous experience, it should be pretty easy to follow.

CODING YOUR APP

The YAML file indicated that we had a Python script called 'main.py', so at this point we should probably write that file. Now the application server is going to run this Python file and expect the code to generate HTML to send back to whatever web client is connecting to it. This sounds like a lot of boring code, but it's actually fairly simple. The GAE environment includes a number of Python modules for interacting with the server and generating responses in the format that a browser is expecting.

The beginning block of code will look like:

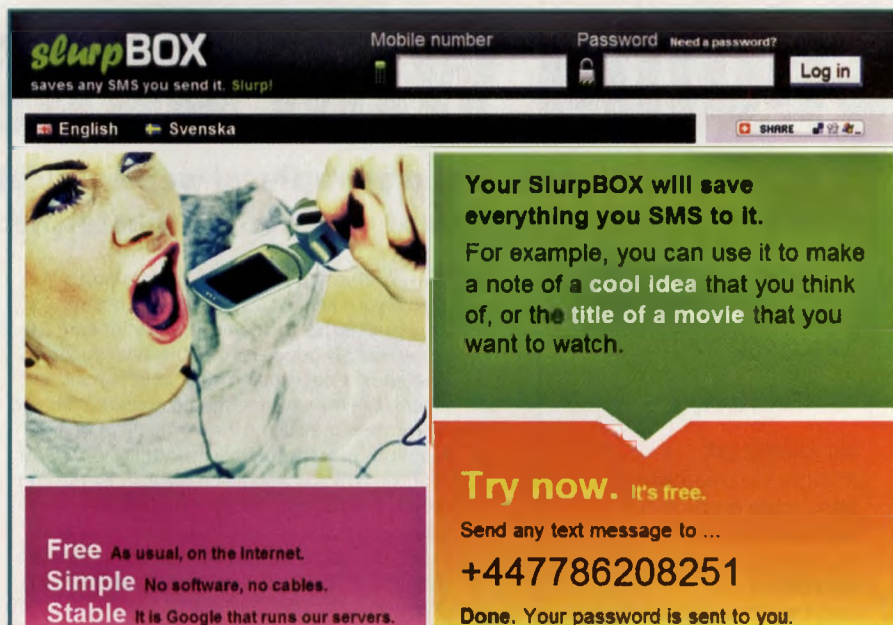
```
import wsgiref.handlers
from google.appengine.ext import webapp
from google.appengine.ext.webapp import template
from google.appengine.api import images
from google.appengine.ext import db
```

In order, these lines import the standard CGI handlers, hooks for the webapp environment, the Django template engine (more on that later), the images module and the Google database module (the Datastore).

Now we can actually get down to creating the application. The standard way of constructing a Python application is to code all the classes and functions as standalone blocks of code. The first executable lines of code are usually found at the end of the file and use Python's environmental variables to determine whether the code has been run as a standalone. We'll create our code in the same way and call a 'main()' function:

```
def main():
    application = webapp.WSGIApplication([(r'.*',
    MainPage)], debug=True, wsgiref.handlers.
    CGIHandler().run(application)
if __name__ == "__main__":
    main()
```

OK, so now we have some code that will almost run. The main() function defines an application that will respond to all requests and pass them



on to an as-yet undefined MainPage object. The built-in handlers are called to run this application. All this magic means that the POST and GET actions performed on your server will be passed through to the relevant methods of the object. So, MainPage will — at the very least — need to have methods called 'get' and 'post' to actually handle these events and deal with the incoming and outgoing data.

Let's create the MainPage class and a method for dealing with the get request:

```
class MainPage(webapp.RequestHandler):
    def get(self):
        self.response.out.write(template.render('main.
        html', {}))
```

The class definition identifies it as a request handler so that the requests are sent through to the relevant methods. The one we were concerned with was 'GET': the standard request to view an object on the server. This should return properly formatted HTML, but there's no need to write lines and lines of code just to spit some more out. Instead, we will make use of the Django templates that we mentioned before.

The template render method takes arguments for a file and a Python dictionary of variables. Any data that you wish to use in the template has to be packed into this dictionary (you can find out more about dictionaries at <http://docs.python.org/tut/node7.html>), but for the moment we'll just use this method to serve up an HTML file.

As you can see, our application designing process seems to be about writing bits of code that just push the problem around, but that's how good code should be written!

Our HTML document needs to have the code

for a form to upload our image. We'll handle the 'POST' method within the same Python class that we made earlier, so it should use the POST method to send the data to the same web entity.

We have to use the 'multipart/form-data' type to make sure that the file being uploaded is encoded properly for the handler to use (as well as for any other data that we want to use):

```
<html><body>
<form action="" method=post
  enctype="multipart/form-data"> <p>Select an
  image to be uploaded for mungification:
  <input type=file name=file accept="text/
  html"></p>
  <p><input type=submit value="Do it!"></p>
</form>
</body></html>
```

As you can see, the form will send a POST request to the same web address, with a file called 'file' encoded. We can use any of the methods provided by Google's images module to process the uploaded file. There are a number of simple effects available, but the most useful one for our purposes here is the 'Im_feeling_lucky()' method. This is borrowed from Google's Picasso photolibrary and basically tries to perform an intelligent contrast/brightness/saturation transformation. The images module handles images in string-encoded format, which is great because that is just what we have. In fact, there is no need for messing around; we can pass the input from our POST data straight in:

```
inimage=images.im_feeling_lucky(self.request.
get("file"))
```

The only slight problem we have is working out



script: transform.py

```
out2=db.BlobProperty()
```

and serve them up. Easy-peasy. The code for handling our POST request now looks like this:



This is only the start of the freedom to create that the App Engine gives you. Don't feel constrained by Google's own apps — just use the power. **BTW**

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Sony Ericsson W980 Walkman Phone

Sony, not wanting to be outdone by Apple, has introduced its own hybrid MP3/phone to the market, the W980. What is essentially a Sony Walkman and a mobile phone crammed into a cool clamshell body is sure to be a hit with the Christmas shoppers. With an externally accessible Walkman player with intuitive controls, 8GB of internal memory, eight equaliser presets and the ability to send your music via an FM transmitter to friends or your car stereo in real time, the W980 is a competitive combination of two of the most popular devices in one.

CONTACT Sony Ericsson
ONLINE www.sony.com.au
PRICE \$585

VERDICT ★★★★★



Iron Man Blu-ray

One of the most under-sold superheroes makes his arrival on Blu-ray with the help of a sobered-up Robert Downey Jr. In what is surely the second best 'billionaire turns vigilante with high-tech gadgets' flick of the year, *Iron Man* is a thrill ride of action writ large with stunning sound and visuals. Downey Jr.'s performance as Tony Stark is surprisingly down to earth for a 'serious actor'. He manages to bring a sense of reality and humour to what is essentially a fantasy world. With a good story, great characters and gadgets galore, *Iron Man* is a must-see experience.

CONTACT Paramount Pictures
ONLINE www.paramount.com.au
PRICE \$44.83

VERDICT ★★★★★



Lowepro Inverse 100 AW

A camera bag is a camera bag. Wrong! Anyone who has ever tried to lug a DSLR and a few spare lenses on a cross-country hike will know that camera gear can be as awkward to carry as it is heavy. The Inverse 100 AW beltpack camera case offers cushioned support and a contoured mesh lumbar belt to evenly distribute weight, making it a safe place to store your gear while also being comfortable to carry. The quick-access top lets you work out of your pack with minimal effort. An All Weather Cover provides protection from rain, sand and dust. Not cheap, but worth it.

CONTACT Lowepro
ONLINE www.lowepro.com.au
PRICE \$99

VERDICT ★★★★★

Street Kings Blu-ray

Keanu gets old and turns nasty in this dark and cynical look at the world of crime and policing. With his trademark wooden performance and a bootload of ammo, Keanu gets the chance to play an emotionally dysfunctional and homicidal cop. Heavy violence ensues as he attempts to clear his name after being blamed for the murder of another policeman. A strong cast of supporting actors including Forest Whitaker and Hugh Laurie adds respectability to what is an overly violent, confronting and pessimistic tale of life in the big city. One for the boys.

CONTACT Twentieth Century Fox
ONLINE www.foxpictures.com
PRICE \$39.83

VERDICT ★★★★★



Laser M35 Navig8r

GPS seems to be getting to be as prolific as it is expensive. Laser has introduced a new, locally made device to the market, with highly detailed maps that not only display house numbers but also show property boundaries to help get you exactly where you want to go, and it does it with a real Aussie accent as well. A host of features including trip statistics, points of interest and other downloadable content make this a good, cheap alternative to the big foreign market leaders. You won't find a cheaper GPS with this level of functionality anywhere.

CONTACT Laser
ONLINE www.laser.com.au
PRICE \$249

VERDICT ★★★★★

New iPod nano

The new nano has not only gotten smaller and sexier but it has gotten smarter. It now has the ability to act as your own personal DJ by finding tracks that go well together and creating a thematic, flowing playlist for you. If that doesn't rock your boat, the stylishly thin, curved aluminium edges of the new nano makes its predecessors look ancient by comparison. Available in either 8GB or 16GB models, the new nano holds even more music or video than before. And with a clear, bright 2in screen, your portable entertainment options never looked better (or cheaper).

CONTACT Apple
ONLINE www.apple.com
PRICE \$149 for 8GB

VERDICT ★★★★★

Windows Vista Bible

When you look at the controversy surrounding the latest version of Windows, you can understand why someone has felt the need to write a book about it. *Windows Vista Bible* is packed with comprehensive tutorials and step-by-step guides on how to do everything in Vista. From a thorough coverage of the basics through to advanced topics such as setting up security, building a home office network, plus DVD authoring, this massively thick and concise resource should keep any Windows user out of trouble — and help them to get the most out of their system.

CONTACT Wiley
ISBN 978-0-470-04030-0
PRICE \$39.99

VERDICT ★★★★★

Teach Yourself Visually Adobe Photoshop CS3

Everyone loves to complain about how hard Photoshop is to master. The Teach Yourself Visually series tackles this problem with easy-to-follow instructions that skip the long-winded explanations. Inside you'll find clear, step-by-step screenshots that show you how to tackle more than 150 tasks. Each spread includes easy visual directions for performing everyday operations, from changing image sizes and resolution to applying Smart Filter effects. This will by no means tell you everything there is to know about Photoshop, but it's a great place to start learning.

CONTACT Wiley
ISBN 978-0-470-11452-0
PRICE \$24.99

VERDICT ★★★★★



Okami

Peter Dockrill howls at the moon and paints the sun.

Okami was originally released in Australia in early 2007 on the PS2, and it received rave reviews back then. The original was the final release for Clover Studios, an independent developer who had already achieved some buzz by creating the Viewtiful Joe series. Players familiar with VJ would expect a pretty stylish effort for the company's swansong, and Okami doesn't disappoint.

The first thing you notice about the game is its lush and very distinctive graphical appearance — it's somewhat reminiscent of a 2D anime-style cel-shaded look, but the more subdued palette and 'sumi-e' painting-inspired style gives Okami a more mature look and feel. It's an achievement in visual presentation and really has to be seen to be believed.

In the game, you are cast as the wolf-embodiment of the sun deity Amaterasu (don't ask) and are charged with banishing darkness

and monsters (etc.) from the land. Essentially, the plot isn't particularly remarkable — nor is it anything we haven't seen before from this kind of game: there's the token quirky sidekick sprite who accompanies you on your quest, and the stock-standard NPCs to interact with.

Basically, it all screams 'Zelda clone', but luckily it compares well with that famous series. One notable innovation is that the painting motif of the presentation carries over into the gameplay itself, as, in addition to being a sun-god-wolf, you're also a dab hand with a paintbrush, which you can employ in several ways — ranging from interacting with your environment to daubing (blinding) foes during combat. It's a great use of the Wii Remote and helps to justify the 18-months-later port. Not that we were complaining, mind you: all up, Okami is an arresting, grand and stylish adventure game. And the music is stirring, too.



Okami: great visuals and unique gameplay combine for a memorable experience.

AVAILABLE PLATFORMS

PC-DVD Wii PS3
PSP XBOX 360 NINTENDO DS

CONTACT Red Ant
ONLINE www.red-ant.com.au
PRICE \$89.95

✓ Beautiful, original design; grand adventure.

✗ Did somebody say Zelda?

VERDICT ★★★★★

Spore

Troy Coleman can feel his brain getting a little bit bigger. Just a little.

Putting the single-player back into Massive Online Gaming, Will Wright's (of The Sims cash cow) Spore gives players the opportunity to play God for a while.

The idea behind Spore is an excellent one. Players have been given the tools to create living, breathing organisms — which are then uploaded to a central database and used to populate other players' worlds — and guide their development from their humble, single-cell beginnings through to interstellar domination.

Spore's core gameplay is a mix of free-roaming exploration and real-time-strategy divided between five phases, each harder and more complex than the previous. The Cell and

Creature phases see players create herbivore/carnivore single-cell organisms swimming in a tide-pool, then taking to land, earning DNA and growing a brain as they go.

Gameplay then shifts to a far more serious real-time strategy (RTS) for the next (Tribe and Civilization) phases of Spore, as players establish themselves firstly as a tribe, then as global leaders. From there, the final frontier awaits as players strive to conquer Space.

The RTS aspect of Spore, while not incredibly deep or difficult, is such a stark contrast from the previous phases that there's a definite feeling of disconnect. We actually found the Cell and Creature phase of the game the most engaging



Feeling spored? Take your critter from the gutter to the stars in Spore.

and fun, but unfortunately these can be zipped through in literally an hour or so of gaming. That's not to say the following phases are arduous — on the contrary, total game length was around the six-or-so hour mark.

So what comes next for Spore? Well, considering it does come from the mind of The Sims creator, probably an IKEA Kitchen Pack add-on.

AVAILABLE PLATFORMS

PC-DVD Wii PS3
PSP XBOX 360 NINTENDO DS

CONTACT EA
ONLINE <http://www.spore.com/>
PRICE \$99.95

✓ Excellent concept; fun early on.

✗ Disjointed, inconsistent gaming.

VERDICT ★★★★★

Too Human

Troy Coleman loves Vikings, sometimes hates computers.

Vikings in a cybernetic future? Well, considering there was a series that mixed Cowboys and Space that was three kinds of excellent, we're definitely open to anything Too Human throws at us.

Players assume the role of the cybernetic Norse god, Baldur, who has sworn an oath to protect all human life from a machine army and thwart their efforts of becoming more human by harvesting blood and limbs.

But the plot in Too Human really isn't that important or incredibly deep and merely serves as an unsteady bridge spanning the divide between the vastly different ideals of technology and mythology.

What Too Human is really about is getting back to some single-player RPG dungeon

crawling. It's about wading through hordes of monsters (machines) trained (programmed) to tear the protagonist to shreds and coming out unscathed, with a new set of armour and a few more gold coins in the pocket. The game is set up in the usual RPG manner: players choose from one of five classes, each with their own strengths and weaknesses, delve through a series of dungeons swinging swords, shooting lasers, gaining experience points, levelling up and learning new skills and abilities along the way.

One serious issue with Too Human is the controls. Combat is controlled with the right analogue stick, which foregoes the convention of it controlling a free-roaming camera. This has serious, and very nearly game-



Too Human: great ideas; less than great controls.

breaking, repercussions. Viewing becomes a series of oh-crap-I-forgot weapon swings at nothing while being pummeled from the flanks. And... there is no free-roaming camera!

Online co-op play is also available and players can drop in and out of games at any stage along the way, using the same character for both single and multiplayer dungeon crawling.

AVAILABLE PLATFORMS		
PC-DVD	Wii	PS 3
PSP	XBOX 360	NINTENDO DS
CONTACT Microsoft		
ONLINE www.xbox.com		
PRICE \$89.95		
✓ Fun, mindless mechanical slaughter.		
✗ Quirky controls.		
VERDICT ★★★★★		

Ratchet & Clank Future: Quest for Booty

Christopher Zammit gets shorter and hairier (and starts whacking pirates).



In many ways, Quest for Booty is simply more of the same. But, in this case, that's a good thing.

Ratchet & Clank have been around for a while now, with games on the PS2 and (most recently) on the PS3 with Ratchet & Clank Future: Tools of Destruction, their most visually stunning outing to date. A standalone adventure for both fans and newcomers to the franchise, Ratchet & Clank Future: Quest for Booty offers hours of gameplay in this shorter but fully realised sequel.

The mission at the start of the game is to play as Ratchet, who is on a quest to find his robotic sidekick Clank, who was kidnapped at the end of Tools of Destruction. Not having Clank on your back gives the gameplay a new focus and actually adds a freshness to the way you handle problems and obstacles.

This game isn't just an add-on, with a few newly created levels. Insomniac games has gone to the trouble of actually adding new weapons and equipment to introduce some original gameplay.

All-new wrench mechanics allow you to manipulate objects at a distance. You can now push, pull, drag and lift platforms to gain access to new areas. This new interactivity forces you to think rather than just whack your way through each level.

New pirate-themed puzzles involving mixing brew, manipulating shadows and playing tunes provide the opportunity to find pirate treasure that can be sold or traded for other goodies.

A new level of interactivity with secondary characters adds an immersive quality to the game, as it becomes necessary to question the townspeople in certain levels in order to figure out what to do next.

Although not nearly as long as its predecessor, this high-quality continuation of the Ratchet & Clank saga is well worth a look. At less than \$25, this is a good, cheap game for the whole family. And, at only 3GB, it's easy enough to download from the PlayStation Network.

AVAILABLE PLATFORMS		
PC-DVD	Wii	PS 3
PSP	XBOX 360	NINTENDO DS
CONTACT Sony		
ONLINE PlayStation Network		
PRICE \$29.95		
✓ High-quality gaming; thought-inducing challenges; great fun.		
✗ Too short — bring out another one.		
VERDICT ★★★★★		



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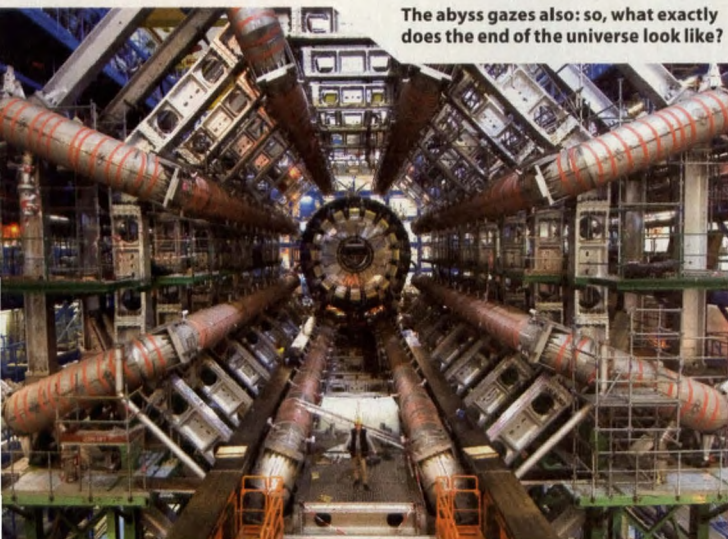
www.thermaltake.com.au



by
Peter Dockrill

Nanna, you've outdone yourself this Christmas!

Nintendo freaks (such as this writer) and fans of generally well-stitched neckwear (um... anybody?) will love this — it's the first level of Super Mario Bros., faithfully recreated in scarf form. That's right, readers, now you can literally wear the Mushroom Kingdom around your neck to keep warm, rendering this an inherently sensible and responsible fashion accessory come wintertime. Just don't expect the chicks to like it. The jury is still out on whether a normal human would find this to be cool. Their loss, right? (Uh... right?) Check out <http://snipurl.com/3qgph> for more.



The abyss gazes also: so, what exactly does the end of the universe look like?

The CCTV at the end of the universe

So, by now we've all heard about the Large Hadron Collider; we've all seen the photographs from within the complex; and we've all had our minds well and truly boggled by the unbelievable stats behind the project: more than 100m under the ground, almost 27km in length, over 20 years in the making, and all for the bargain price of several billion Euros. And, of course, we've all heard the jokes about the end of the universe that may be brought about by everybody's favourite particle

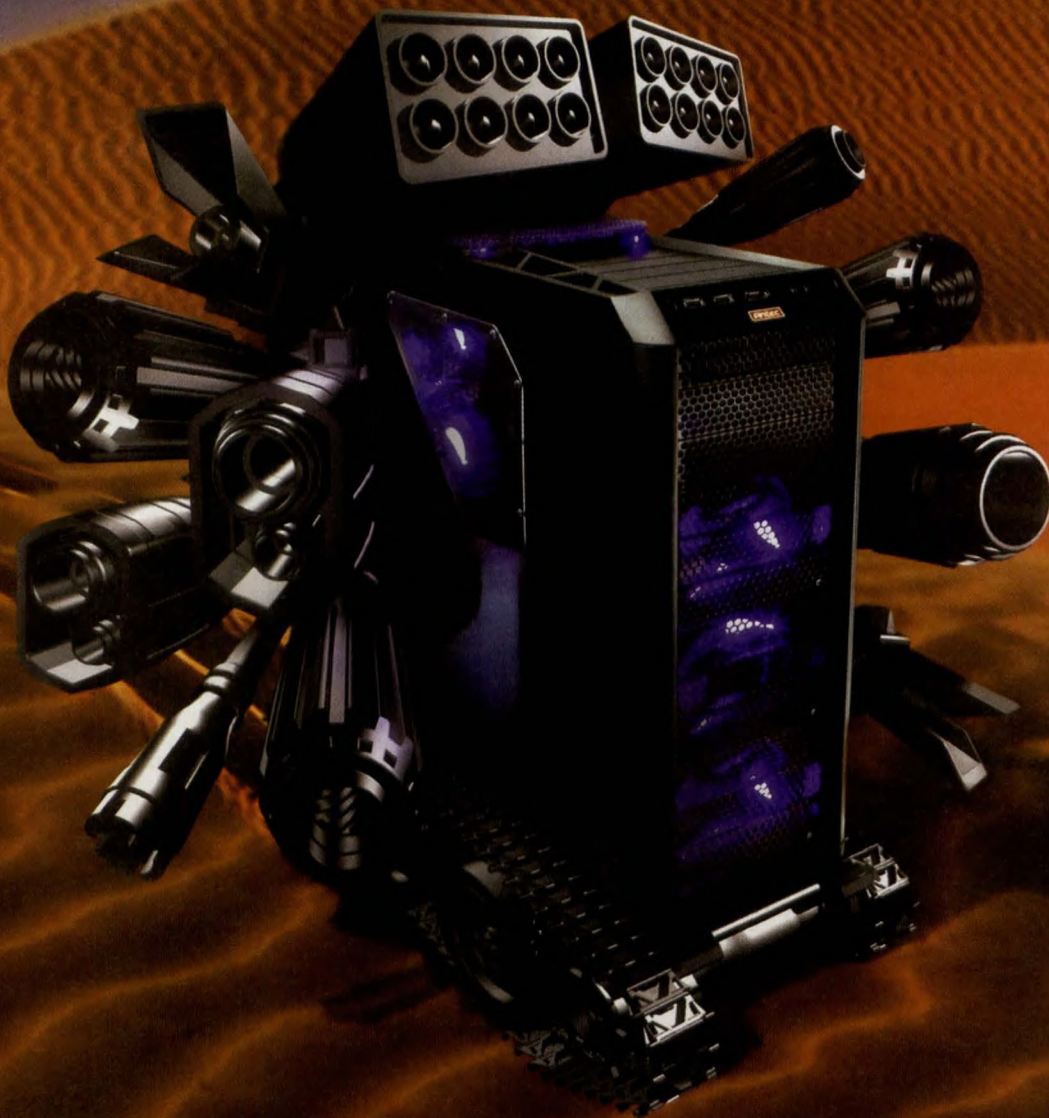
accelerator. But now, we can all afford to relax, because at www.cyrlak.co.uk/lhc/lhc-webcams.html, the folks behind the Collider have set up a webcam system offering 24/7 20/20 surveillance of the world's most ambitious science project. This way, if the world ends, at least some geek somewhere on self-imposed nightwatch (ie. nothing better to do) will be the first to know that the universe has torn itself a new one. Who knows, head on over to the site... it could even be you...

Outbreak... way out

Remember that iconic scene in *Aliens* where Ripley and co. somehow — and just by the skin of their teeth, mind you — manage to make it off the doomed space colony right before the whole thing goes supernova? Only problem is, when they touch down on the Sulaco mothership, they've brought a little stowaway with them: none other than the alien queen herself, prompting Ripley's famous line: "Get away from her, you bitch!"

And so we arrive at the concept of spacebound infection, whereby alien matter corrupts upon its introduction in new environs. Only, it's not just science fiction. NASA recently confirmed that a computer virus from Earth had made its way onto the International Space Station. The extra-terrestrial intruder was discovered on an astronaut's laptop, presumably carried aboard via a personal media device, and, while posing no direct threat to the crew or mission (being considered only a "pest"), Chip Chat can't help but wonder if this unwitting accident is the start of a digital galactic plague of infinitely more sinister dimensions...? Watch this space. **APC**





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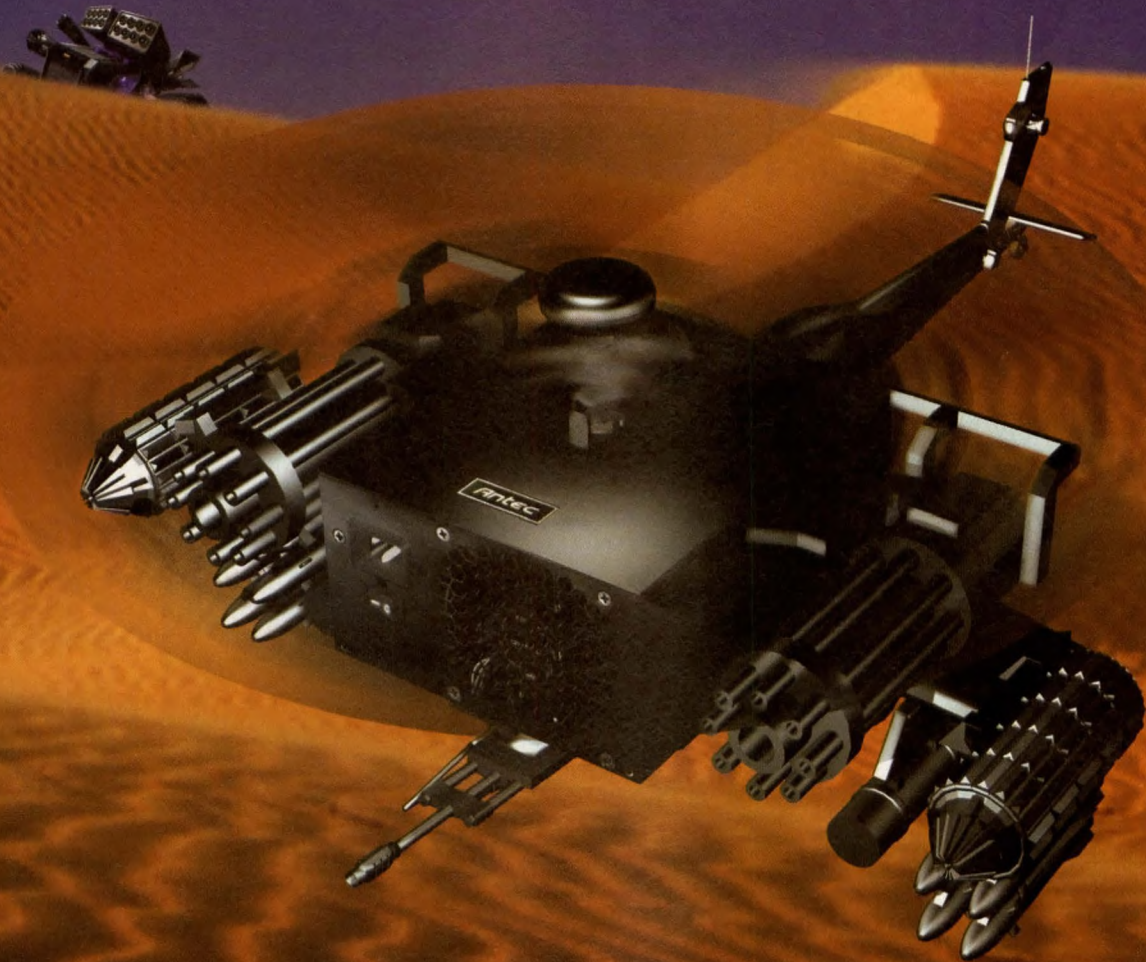
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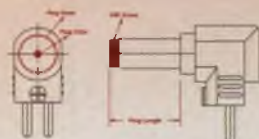
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5.5	2.5	12	Green	ACER / COMPAQ / FUJITSU / GATEWAY / HITACHI / HP / IBM / NEC / PANASONIC / PHILIPS / SAMSUNG / SHARP / TOSHIBA / TWINHEAD / VIEWSONIC / WINBOOK
6.3	3.0	12	Green	ACER / ASUS / COMPAQ / HP
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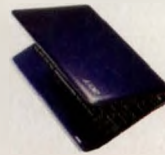
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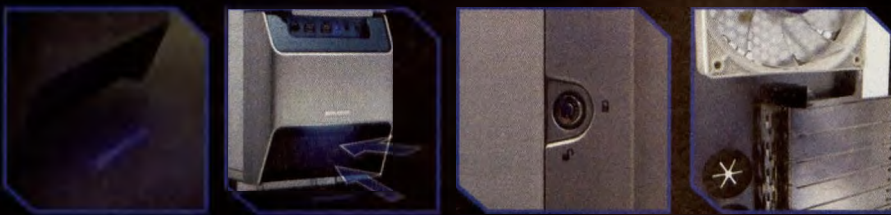
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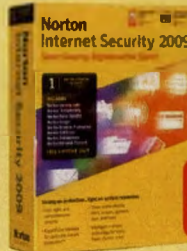
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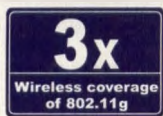
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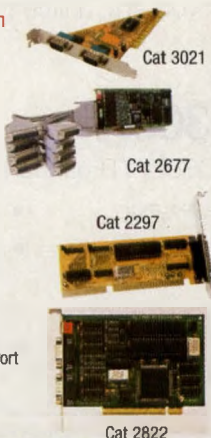


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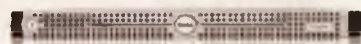
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to an Intel™ Xeon Dual Core 3050 or
Intel™ Xeon Quad Core 3220 processor
on all Entry and Base Level Servers**



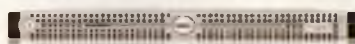
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month

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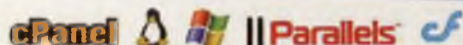
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Portégé R500

- Weighs nothing, does everything
- Optical: DVD SuperMulti Double Layer
- Long battery life (up to 8 hours)
- 3 Year Warranty



Was \$3099
Reduced to:

\$2799

|V7302 | RENT \$25.75/wk*



1.3GHz
Processor

1x1GB#
RAM

160GB
Hard Drive

**EXCLUSIVE
BUNDLE
VALUED AT
\$3498**

see page 4

TOSHIBA Leading Innovation >>>



**BONUS
VALUED AT
\$399**

BONUS Toshiba TEKBRIGHT™
20" Monitor¹ valued at \$399

SERIOUS TECH VALUE

Seagate
Free Agent Go 250GB



\$149 |W0333

brother.
at your side
MFC-9440CN
Colour Laser
Multifunction

\$1149

V1797 | RENT \$10.83/wk*

BONUS 2 Year Onsite Next
Business Day Warranty



see page 23

BONUS

symantec.

**Norton 360
2.0 Premier
Edition**

- Includes 10GB
online storage

\$129 |V9875



NEW

AIPTEK

World's Smallest Projector
Aiptek Pocket Projector

\$649

V9644 | RENT \$6.12/wk*



see page 10

NEW

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Software Licensing
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**Harris Technology
has the solution.**

See page 16 for details.

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Fellowes



\$499 | V0537

6710b Business Notebook



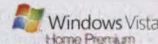
EXCLUSIVE

\$1799

V7163 | Rent \$16.98/wk*

See pg.05

A57 Tower C2Q **lenovo**
Q6600 2GB
320GB VHP + 19" LCD Monitor



\$1299

V9943 | RENT \$12.24/wk* See pg.08

**QuickBooks Plus
2008/09**

Reckon



BONUS

\$579 | V6177

See pg.17

BONUS \$100 Fuel Card

1TB Linkstation Mini

BUFFALO



\$699 | W0348

RENT \$6.59/wk*

See pg.15

**23" Cinema HD
Display LCD**



Authorised
Solutions Reseller



\$1399

T8637 | Rent \$13.20/wk* See pg.09

GO 930 GPS



\$849 | V9249

Rent \$8.00/wk*

See pg.20

**Basic
Optical Mouse**

Microsoft



\$19⁹⁵ | S9174

See pg.07

Touch Diamond



\$999 | V7839

Rent \$9.41/wk*

See pg.20

**Office
Small
Business
2007**

Microsoft

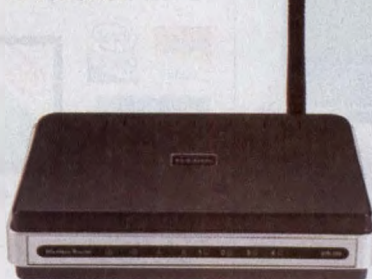


\$499 | U1827

**DIR-300 Wireless
G Router**



Building Networks for People



\$69⁹⁵ | V5010

See pg.13

**3355 Cordless
Phone and Answering
Machine**

Uniden
SOUNDS BETTER



\$169 | U9321

See pg.20

2133 Mini PC

- CPU: VIA C7-M 1.6 GHz
- Memory: 1x2GB
- Hard Drive: 160GB
- Graphics: Intel GMA 950 Dynamic Video Memory Technology 3.0
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + Integrated Webcam



\$969 | V7337 | RENT \$9.13/wk*

Tecra A9 T8100 + 2GB RAM, Bag & Mouse

- CPU: Intel® Core™ 2 Duo Mobile T8100 2.1GHz
- Memory: 1x1GB
- Hard Drive: 120GB
- Optical: DVD SuperMulti Dual Double Layer (DVDRRW, DVDR(DL)DVD-RAM)
- Graphics: Intel Graphics Media Accelerator 965GM with 256MB shared memory
- Wireless: integrated Intel 802.11 a/g/n



TOSHIBA
Leading Innovation >>>

\$2140 | V9682 | RENT \$20.19/wk*

BONUS
2 Year Warranty from Toshiba via redemption

VAIO SR16GNB P8400

- CPU: Intel® Core™ 2 Duo Processor P8400 2.26GHz
- Memory: 1x2GB
- Hard Drive: 250GB HDD
- Optical: DVD±RW / ±R DL / RAM Drive
- Graphics: ATI Mobility Radeon™ HD 3470
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: integrated webcam



SONY

\$2199 | V9432 | RENT \$20.75/wk*

Also available:

\$2199 | V9433 | PINK | RENT \$20.75/wk*

\$2199 | V9434 | SILVER | RENT \$20.75/wk*

Aspire One N270

- CPU: Intel Atom Processor 1.6GHz
- Memory: 1GB
- Hard Drive: 120GB
- Graphics: Intel Graphics Media Accelerator
- Connectivity: integrated wireless a/b/g + Integrated Webcam



\$99 CASHBACK!

\$546 | W0136

BEFORE CASHBACK YOU PAY \$645 | RENT \$6.08/wk*

Also available:

Sapphire White | W0137 | \$546

BEFORE CASHBACK YOU PAY \$645 | RENT \$6.08/wk*

SL500 P8600

- CPU: Intel® Centrino™ 2 Duo P8600 2.4GHz
- Memory: 1x2GB
- Hard Drive: 250 GB
- Optical: DVD±RW (±R DL) / DVD-RAM
- Graphics: NVIDIA GeForce 9300M 256MB Dedicated Video Memory
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + Integrated Webcam



lenovo

\$1849 | V8537 | RENT \$17.45/wk*

Portégé R500 U7700

- CPU: Intel® Core™ 2 Duo Processor U7700 1.3GHz
- Memory: 1x1GB
- Hard Drive: 160GB
- Optical: DVD±RW (±R DL) / DVD-RAM
- Connectivity: integrated wireless a/g/n + Bluetooth
- 3 Year Warranty



Was \$3099

Reduced to:

\$2799 | V7302 | RENT \$25.75/wk*

BONUS Toshiba TEKBRIGHT™ 20" Monitor valued at \$399

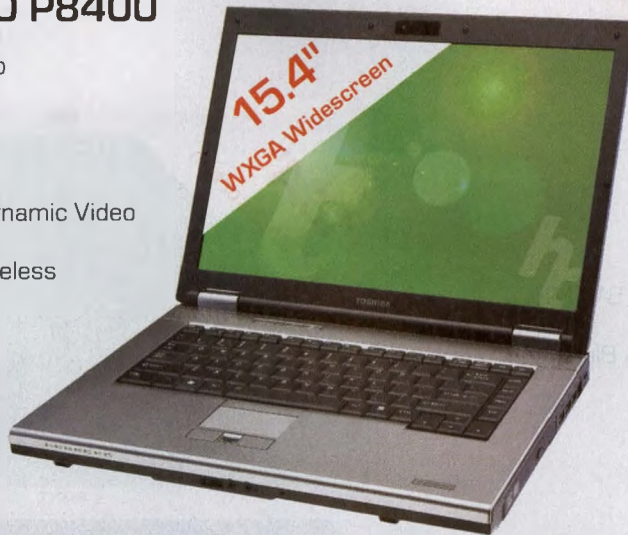
TOSHIBA
Leading Innovation >>>

EXCLUSIVE BUNDLE VALUED AT \$3498

*For terms and conditions, including RentSmart, see page 20. *Available capacity of hard drive may be less due to preinstalled software.
1 Bonus Toshiba TEKBRIGHT™ 20" Monitor via redemption from Toshiba effective from 1st September - 30th November.

Satellite Pro S300 P8400

- CPU: Intel® Centrino™ 2 Duo Processor P8400 2.26GHz
- Memory: 2x1GB
- Hard Drive: 160GB
- Optical: DVD±RW/±R DL
- Graphics: Intel GMA 950 Dynamic Video Memory Technology 3.0
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 3x USB 2.0 + integrated webcam



harristechnology



TOSHIBA
Leading Innovation >>>



\$1599

V9638 | RENT \$15.09/wk*

ThinkPad R61e T8100

lenovo

- CPU: Intel® Core™ 2 Duo Processor T8100 2.1GHz
- Memory: 1x1GB
- Hard Drive: 120GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: Intel GMA X3100 Dynamic Video Memory Technology 4.0
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 3x USB 2.0 + integrated webcam



\$1339 | V6227 | Rent \$12.63/wk*

8510p T9300



- CPU: Intel® Core™ 2 Duo Processor T9300 2.5GHz
- Memory: 1x2GB
- Hard Drive: 250GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: ATI HD 2600 256MB dedicated video memory
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + integrated webcam



\$1799 | V7852 | Rent \$16.98/wk*

Satellite Pro P300 T9400

TOSHIBA
Leading Innovation >>>

- CPU: Intel® Core™ 2 Duo Processor T9400 2.53GHz
- Memory: 2x2GB
- Hard Drive: 640GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: ATI Mobility Radeon HD 3650
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + integrated webcam

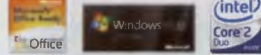


\$2420 | V9611 | RENT \$22.38/wk*

VAIO FW17GU T9400

SONY.

- CPU: Intel® Core™ 2 Duo Processor T9400 2.53GHz
- Memory: 2x2GB RAM
- Hard Drive: 250GB
- Optical: DVD±RW (±R DL)/DVD-RAM / BLU-RAY
- Graphics: ATI Mobility Radeon HD 3470 - 512 MB dedicated video
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + integrated webcam



\$3399 | V9428 | Rent \$30.92/wk*

Microsoft Medialess License Kit (MLK)

The Medialess License Kit is the new way of purchasing Microsoft Office 2007 Professional and Small Business. Microsoft ready PC doesn't require any installation disks. Simply purchase this MLK to activate the Microsoft Office of your choice.

Medialess License Kits

V4773 | MS Office Professional 2007 | \$432
V4774 | MS Office Small Business 2007 | \$399

Extended Warranty

Protect your investment with a HT Extended Warranty Plan

- Cover for wear and tear, including parts and labour.
 - 'No Lemon' Guarantee*
 - 7 day customer service helpline

To find out more information on Extended Warranty, ask a Harris Technology team member.

*For terms and conditions, including RentSmart, see back page. *Available capacity of hard drive may be less due to preinstalled software.

SONY

VAIO FW15G P8400

- CPU: Intel® Centrino™ 2 Duo Processor P8400 2.26GHz
- Memory: 1x2GB
- Hard Drive: 250GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: ATI Mobility Radeon HD 3470 - 512 MB dedicated video
- Connectivity: integrated wireless a/g/n & Bluetooth



Windows Vista
Home Premium



\$1999 | V9430 | RENT \$18.86/wk*

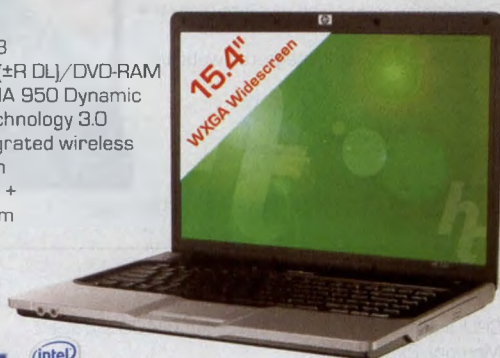
Also available:

V9431 | \$1999 | WHITE | RENT \$18.86/wk*



530 T2400

- CPU: Intel® Core Duo Processor T2400 1.83GHz
- Memory: 1x2GB
- Hard Drive: 120GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: Intel GMA 950 Dynamic Video Memory Technology 3.0
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + integrated webcam



Windows Vista
Home Premium



\$899 | V3564 | RENT \$8.47/wk*

Extensa 5620 T5750 + Bonus Bag

acer

- CPU: Intel® Core™ 2 Duo T5750 1.83GHz
- Memory: 1x2GB
- Hard Drive: 160GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: Intel X3100 shared graphics
- Connectivity: integrated wireless a/g/n + Bluetooth
- Other: 2x USB 2.0 + integrated webcam
- 2 Year Warranty



Windows Vista
Home Premium



\$821 | V9412 | RENT \$9.14/wk*
BEFORE CASHBACK YOU PAY \$970

VAIO NR37GS T2390

- CPU: Intel® Pentium® Dual-Core Processor T2390 1.86GHz
- Memory: 1x2GB
- Hard Drive: 200GB
- Optical: DVD±RW (±R DL)/DVD-RAM
- Graphics: Mobile Intel® Graphics Media Accelerator X3100
- Connectivity: integrated wireless a/g/n + Bluetooth

SONY



Windows Vista
Home Premium



\$1299 | V9426 | RENT \$12.24/wk*



MacBook Air



Authorised
Solutions Reseller

- 2GB RAM
- Built-in iSight camera
- Full-size backlit keyboard
- Ultra thin, ultra portable. 1.36 kg
- Integrated wireless Airport Extreme



\$2499 | V5332 | RENT \$23.12/wk*

*For terms and conditions, including RentSmart, see backpage of catalogue. *Available capacity of hard drive may be less due to pre-installed software.

Basic Optical Mouse V2

- Optical technology allows user to navigate with better speed, accuracy and reliability
- Get one-click access to frequently used features with customisable buttons
- Provides smooth tracking on virtually any surface
- Ambidextrous design provides comfort in either hand
- PS/2 and USB compatible

\$19⁹⁵ | V2339



Microsoft

V220 Cordless Notebook Mouse

- Comfortable and compact cordless mouse for notebooks with snap-on receiver
- Mini-receiver snaps onto the mouse and turns it off
- High-definition optical technology is more responsive
- Up to 6 months' battery life with low-battery indicator
- Side-to-side scrolling plus zoom: instantly zoom in and out, horizontally or vertically

\$39⁹⁵ | V0372



Logitech

Ultra Flat Keyboard

- Experience superior typing comfort with an ultra-low profile keyboard
- Adjustable keyboard height provides ergonomic comfort
- Stylish design complements flat-screen monitors and allows users to save space
- System requirements:
Windows Vista & Windows XP/2000/98
- USB & PS/2 enabled

\$35⁹⁵ | T9384



Logitech

Natural Ergonomic Keyboard 4000 **Microsoft**

- Ergonomic design with integrated palm rest encourages natural wrist and arm alignment, providing users with total comfort
- Zoom in quickly and accurately with intuitive zoom
- Media controls allow users to navigate to next track, previous track, play, pause and volume control
- Five customisable keys allow users access to frequently used files, folders and websites
- Improved number pad allows easy access to commonly used symbols such as equals, left and right keys and backspace

\$74⁹⁵ | T0577



Cordless Desktop EX-110

- Contemporary design complements workspaces and provides comfort
- Durable, spill-resistant design protects the keyboard from accidental spills
- 27 Mhz wireless connectivity ensures reliability, speed and accuracy
- Multimedia controls allow users to access music, videos, internet, email, volume control and more
- Programmable F-Keys allow instant access to favourite applications, games, folders and webpages
- Cordless mouse provides extreme precision that allows users to scroll through documents with ease

\$74⁹⁵ | S8949



Logitech

Wireless Laser Desktop 6000 V2 **Microsoft**

- Ultra-thin comfort curve design with detachable cushioned palm rest, allows users to work naturally and comfortably
- Zoom in quickly and accurately with intuitive zoom
- Media controls allow users to navigate to next track, previous track, play, pause and volume control
- Five customisable keys allow users access to frequently used files, folders and websites
- Includes Gadgets button, providing one touch access to weather information and news updates
- Microsoft® High Definition Laser Mouse products are more precise, more responsive, and deliver smoother tracking

Was \$119
\$79 | V0410



GREAT VALUE

LS-21 Speakers

- Stylish 2.1 stereo speakers can be connected to PCs for full balanced audio while accessing games, movies and music
- Down-firing subwoofer provides rich, deep bass to enhance sound
- Wired remote allows easy control over volume and power
- Cable management system helps to reduce desk clutter
- Includes headphone jack for private listening
- Total peak power: 14 watts

\$44⁹⁵ | V8369



Logitech

Portable Notebook LapDesk

- The Targus Notebook Portable LapDesk is a folding tray that supports a notebook computer while on laps
- Protects users from heat generated by laptops, and also increases airflow underneath notebooks
- The LapDesk can be packed easily in a notebook bag alongside a notebook and allows users to create a mobile workspace at home, in the car or on a plane
- Converts into a tilt stand, with 5 adjustable angles for maximum comfort
- Weight: 413.9g

\$49⁹⁵ | J2022



Targus

Veriton T661 XPP

- Intel Core 2 Quad Q6600
- 2GB 667MHz DDR2 SDRAM (2 x 1GB)
- 320GB* SATA Hard Drive
- 16x Dual Layer DVD±RW Drive
- Intel Graphics Media Accelerator 3100
- Windows XP Professional
- 3 Year Onsite Warranty


WINDOWS XP PRO INSTALLED


WITHOUT MONITOR

\$1299 | V4793 | RENT \$12.24/wk*
 WITH VISTA BUSINESS | V8455

WITH BLACK 22" LCD MONITOR

\$1599 | V4863 | RENT \$15.09/wk*
 SILVER | V8288

A57 Tower C2Q Q6600 2GB 320GB VHP + 19" LCD Monitor
lenovo

- Intel Quad Core Q6600
- 2GB DDR2 RAM
- 320GB 7200rpm Hard Drive
- Vista Home Premium installed
- Lenovo L194W LCD monitor
- 1 Year Manufacturer's Warranty


\$1299 | V9943 | RENT \$12.24/wk*

Also available:

 W0356 | **\$1399** | With Windows Vista Business | RENT \$13.20/wk*

A57 Small Form Factor ThinkCentre
lenovo

- Intel Core 2 Duo E8400 3GHz
- 2GB 667MHz DDR2 RAM (2 x 1GB)
- 320GB* SATA Hard Drive
- 16x Dual Layer DVD±RW Drive
- Windows XP Professional
- 1 Year Limited Onsite Warranty


WINDOWS XP PRO INSTALLED

WITHOUT MONITOR

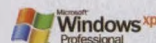
\$1249 | V6202 | RENT \$11.77/wk*

WITH 22" LCD MONITOR

\$1479 | V6478 | RENT \$13.95/wk*

dx7400 Business Desktop


- Intel Quad Core Q9300
- 2GB DDR2 SDRAM
- 250GB 7200rpm Hard Drive
- Microsoft Windows Vista Business with Windows XP Professional Downgrade CD
- 1 Year Limited Manufacturer's Warranty


WINDOWS XP PRO INSTALLED


WITHOUT MONITOR

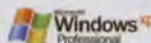
\$1599 | V9615 | RENT \$15.09/wk*

WITH 22" LCD MONITOR

\$1699 | V9624 | RENT \$16.03/wk*

dx2300 MT C2D E4600


- Intel Core 2 Duo E4600 2.4 GHz
- 2GB DDR2 RAM
- 250GB 7200rpm Hard Drive
- Microsoft Windows XP Professional
- 1 Year Manufacturer's Warranty


WINDOWS XP PRO INSTALLED

\$799 | V8678 | RENT \$7.53/wk*

iMac 20" 2.66GHz


Authorised Solutions Reseller

- All in One Apple iMac
- Intel Core 2 Duo 2.66GHz
- 2GB DDR2 RAM
- 320GB 7200rpm Hard Drive
- ATI Radeon HD 2600Pro
- 256MB DDR2
- Bluetooth 2.1 EDR, 802.11 a/b/g/n (draft), Gigabit Ethernet


\$1999 | V7842 | RENT \$18.86/wk*


*For terms and conditions, including RentSmart, see page 24. *Available capacity of hard drive may be less due to preinstalled software.

Syncmaster 943N

- Resolution: 1280 x 1024/75Hz
- Brightness: 300 cd/m²
- Contrast ratio: 8000:1 (dynamic)
- Response time: 5ms
- Dot pitch: 0.294 mm



\$259 | V5911

Syncmaster 743B

- Resolution: 1280 x 1024/75Hz
- Brightness: 300 cd/m²
- Contrast ratio: 7000:1 (Dynamic)
- Response time: 5ms
- Viewing angle: 170°/160°
- Available in black or silver finish



\$269 | V5325
BLACK | V5324

X193WB

- Interface: analogue/digital
- Resolution: 1440 x 900/75Hz
- Response time: 5ms
- Contrast ratio: 2000:1
- Brightness: 300 nits
- Wall mountable
- Tilt function
- 3 Year Limited Warranty



\$279 | V2648

FA-19W

- Interface: analogue/digital
- Resolution: 1440 x 900
- Response time: 5ms
- Contrast ratio: 500:1
- Brightness: 300 nits
- Built-in speakers
- 3 Year Limited Warranty



\$279 | V1324

Syncmaster 2253LW

- Display ratio: 16:10
- Contrast ratio: 8000:1 (dynamic)
- Brightness: 300 cd/m²
- Resolution: 1680 x 1050
- Response time: 2ms



\$349 | V7479

X213WB

- Display ratio: 16:10
- Contrast ratio: 2500:1 (dynamic)
- Brightness: 300 cd/m²
- Resolution: 1680 x 1050
- Response time: 5ms



\$326 | V8211

Syncmaster 2243BW

- Dot pitch/pixel pitch: 0.282 mm
- Max resolution: 1680 x 1050/60Hz
- Colour support: 24-bit (16.7 million colours)
- Image aspect ratio: 16:10
- Response time: 5ms
- Image brightness: 300 cd/m²
- Image contrast ratio: 1000:1/8000:1 (dynamic)
- Signal input: DVI-D, VGA



\$329 | Matte Finish | V5326
\$355 | Glossy Finish | V9519

23" Cinema HD Display LCD



Authorised
Solutions Reseller

- Interface: digital
- Resolution: 1920 x 1200
- Contrast ratio: 700:1
- Brightness: 400 nits
- Sleek anodised aluminium case



\$1399
T8637 | RENT \$13.20/wk*

WORLD'S SMALLEST PROJECTOR Aiptek Pocket Projector

- Brand new LED light source
- Never change bulbs again
- Instant start-up
- Projects 50" image at a distance of 1.8m
- Resolution: 640 x 480
- 45 minutes Li-ion battery life
- Integrated stereo speakers
- Expansion: SD, SDHC, USB 2.0, AV input
- Compatibility: AVI, ASF, MP3 and JPEG files
- Includes tripod, pouch and remote control



\$649

| V9644 | RENT \$6.12/wk*

AIPTEK



TLP-X100

TOSHIBA

Leading Innovation >>>

- 3LCD technology
- Resolution: XGA
- Brightness: 2200 ANSI lumens
- Contrast ratio: 400:1
- Weight: under 2kg
- Low noise design



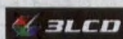
\$1299 | W0050 | RENT \$12.24/wk*

BONUS 75" Tripod Projector Screen or Aluminium Carry Box¹

NEC

TOSHIBA

Leading Innovation >>>



acer



TOSHIBA

Leading Innovation >>>



NP-100G

- DLP technology
- SVGA resolution (800 x 600)
- 2000 ANSI lumens
- 1200:1 contrast ratio
- Weight: 2.4kg
- 2 Year Limited Warranty

TDP-XP2

- DLP technology
- XGA 1024x768 resolution
- 2500 ANSI lumens
- 2000:1 contrast ratio
- Weighs 2.2kg
- 3 Year Warranty
- Integrated speaker
- 90 Day Lamp and Product Replacement

P1265

- DLP technology
- SXGA+ 1400 x 1050 max resolution
- 2400 ANSI lumens
- 2000:1 contrast ratio
- Weighs 3kg
- 2 Year Return To Base Warranty
- Integrated speaker
- Includes remote control with laser pointer

TDP-P9 ULTRA LIGHT

- DLP technology
- XGA 1024 x 768 resolution
- 2000 ANSI lumens
- 2000:1 contrast ratio
- Weighs only 1.3kg
- 3 Year Warranty
- Integrated speaker
- 90 Day Lamp and Product Replacement
- Includes soft carry case and remote

\$686

V7557 | \$6.46/wk*

\$1269

V8544 | \$11.96/wk*

\$1299

V2860 | \$12.24/wk*

\$1649

V3644 | \$15.56/wk*

BONUS 75" Tripod Projector Screen or Aluminium Carry Box¹

BONUS 75" Tripod Projector Screen or Aluminium Carry Box¹

*For terms and conditions, including RentSmart, see back page of catalogue. ¹Bonus via redemption from Toshiba.

ProLiant ML110G5 Server Bundle SBS Standard

- Dual-Core Intel Pentium® Processor E2160 Processor (1.8GHz, 65W, 800MHz FSB, 1MB L2 Cache)
- 1GB PC2-6400 ECC (DDR2-800MHz)
- HP embedded 6 port SATA controller with embedded RAID
- 2 x 160GB NHP SATA HDDs
- 16x SATA DVD-ROM
- Microsoft Windows SBS Standard Edition R2



\$1499 | V5745 | RENT \$14.14/wk *

Also Available: **ProLiant ML110G5 E2160
Server Bundle SBS Premium**
V5744 | \$2099 | RENT \$19.80/wk *

Universal Series UPS Serial & USB

- 800VA and 450W output power
- 45ms backup time
- RJ-11 and RJ-45 outlet connectors
- Bulldog Plus shutdown software (compatible with Windows XP)
- Provides 4 sockets: 3 battery backup sockets w/surge protection; 1 socket with surge protection only
- 3 Year Warranty



BELKIN

\$369 | H9169

Back-UPS RS 1000VA

This high performance desktop battery backup features maximum protection in a versatile design. The fully featured APC Back-UPS RS can be placed on the floor, or on a shelf.

- 1000VA and 600W output power
- 16.6ms backup time with half load and 5.9ms with full load
- 6x IEC 320 C13 and 2x IEC 320 C13 surge

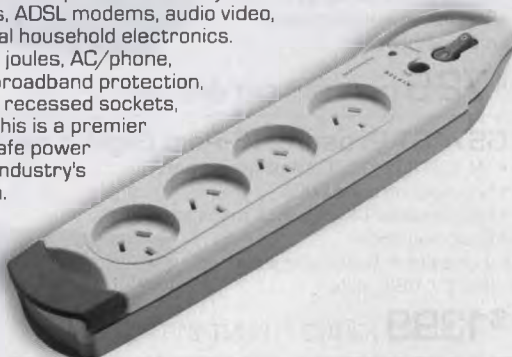


APC

\$499 | J5134

Home Series 4-Way (2m Cord) + \$40,000 Warranty

The Belkin Home Series is perfect for entry-level computers, printers, ADSL modems, audio video, and everyday general household electronics. Offering up to 1034 joules, AC/phone, fax/modem, cable-broadband protection, cable management, recessed sockets, and insulated pins, this is a premier solution for clean, safe power protection and the industry's best in construction.



BELKIN

\$46 | N3358

Gold Series 8-Way (2m Cord) + TEL + \$250,000 Warranty

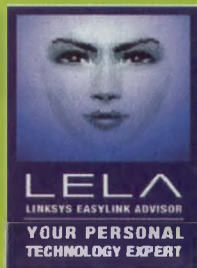
The Gold Series is perfect for professional workstations, laser printers, broadband modems, home theatre systems, Ethernet networks, and everyday household electronics. Offering up to 3240 joules, AC/phone, fax/modem, coaxial/cable-broadband protection, Ethernet protection, 360° rotating plug with insulated pins, cable management, and recessed sockets.



BELKIN

\$123 | N3352

*For terms and conditions, including RentSmart, see page XX. †Onsite warranty is up to 80km from an HP Authorised Onsite Service Provider.



Hello LELA! Your Personal Technology Expert

LINKSYS
A Division of Cisco Systems, Inc.

These new generation Linksys routers come with LELA (Linksys EasyLink Advisor), a free software that is designed to simplify the set up and management of your wireless networks.

LELA works in the background and it tracks potential problems or security breaches before they do any damage. It also configures all devices and has a display to monitor operating status. Get connected wirelessly with Linksys!

WRT160N Ultra RangePlus Wireless-N Broadband Router

- Internet-sharing router and 4-port switch, with a built-in speed and range enhanced wireless access point
- MIMO technology uses multiple radios to create a robust signal that travels farther and reduces dead spots



\$149 | V7034

WAG160N Wireless N ADSL2/+ Gateway

- High-speed ADSL2+ modem gives you a fast, "Always On" connection to the Internet
- Connect your PCs via the built-in router and 4-port switch to jump start your ethernet network and share the Internet
- Built-in Wireless N (draft 802.11n) access point also lets you connect without running wires – far faster than standard Wireless G



\$199 | V7268

WRT310N Wireless-N Gigabit Router

- Internet-sharing router and 4-port gigabit switch, with a built-in speed and range enhanced wireless access point
- MIMO technology uses multiple radios per band to create robust signals for maximum range and speed, with reduced dead spots
- Much faster than Wireless-G, but also works great with Wireless-G and -B devices



\$218 | V7269

OFFICE NETWORKING SOLUTIONS

D-Link
Building Networks for People

Web Smart DES-1228P – Switch

- 24 Ports IEEE 802.3af PoE
- 802.1p, 802.1Q, 802.1D
- CPU DoS protection to ensure uptime



\$795 | U8798 | RENT \$7.49/wk*

Also available: Wireless Switching 108g Access Point for DES-1228P | V9058 | \$159



DFL-260 UTM Firewall for SOHO

- Integrated firewall/VPN appliance
- Intrusion Prevention System (IPS)
- Anti-Virus (AV) protection
- Web content filtering (WCF)



\$999 | V5016 | RENT \$9.41/wk*

Also available: DFL-210 NetDefend™ Security Firewall for SOHO T8412 | \$629 | RENT \$5.93/wk*



DGS-1216T 16-Port Smart Switch

- 32Gbps switching capacity
- 10/100/1000Mbps migration
- Fiber media support via SFPs
- 4,000 MAC address table



greent Ethernet

\$549 | N1045



NETGEAR

GS108T ProSafe 8-Port Gigabit Smart Switch

- 8 10/100/1000 ports
- 802.1x, ACLs
- Rate limiting
- DSCP/TOS-based prioritisation
- IGMP Snooping, SNMP v1, v2, RSTP
- Easy to manage through web-based GUI



\$265 | U8869

GS724T Prosafe 24-Port Gigabit Smart Switch

- Ideal for growing businesses who want the benefits of management without the cost and complexity of traditional managed switches.
- 24 10/100/1000 Mbps gigabit ports
- Non-blocking bandwidth
- Easy, browser-based switch management



\$729 | N3147 | RENT \$6.87/wk*



GS748T Prosafe 48-Port Gigabit Smart Switch

- 48 10/100/1000 Mbps gigabit ports
- Non-blocking bandwidth
- Easy, browser-based switch management
- Rack mountable
- 4 small form-factor pluggable (SFP)* GBIC slots



\$1399 | Q9557 | RENT \$13.20/wk*



*For terms and conditions, including RentSmart, see page 20.

D-Link
Building Networks for PeopleNETWORK SWITCHING | WIRELESS LAN | ROUTING | FIREWALL | VPN
IP CAMERAS | VOIP | NETWORK STORAGE | SERVICES & SUPPORT**DIR-300 Wireless G Router**

- IEEE 802.11b/g compatible
- Share your internet with free Tomzone hotspot
- Share your internet connection with built-in 4-port switch
- Advanced firewall and security
- Advanced scheduling and user level control
- Supports VPN passthrough
- WPA (TKIP) and WPA2 (AES) support
- Interactive install guide
- UPnP support

**\$69⁹⁵** | V5010

DWA-110 WIRELESS G USB ADAPTOR V5013 | \$39

DSL-G604T Wireless G ADSL2/2+ Modem/Router with 4 Ports

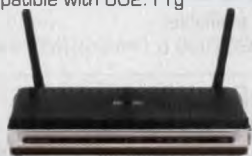
- ADSL2/2+ modem/router with 54Mbps wireless and built-in 4 port switch
- Built-in SPI firewall, DHCP Server
- 4 port Fast Ethernet and 802.11g wireless connectivity

**\$119** | P3062

DWA-510 WIRELESS G DESKTOP ADAPTER V5014 | \$39

DIR-615 Wireless N Router

- Share internet access with PCs, game consoles, and media players
- Parental controls to supervise internet activity
- Firewall protection for your network
- Backward compatible with 802.11g and 802.11b

**\$99** | V2323

DWA-110 WIRELESS G USB ADAPTOR | V5013 | \$39

**DSL 2740B RangeBooster N™ ADSL/ADSL2/2+ Modem Router**

- Draft 802.11n wireless LAN specification, backward compatible with 802.11b/g devices
- Multiple SSIDs
- Up to 270Mbps raw data transfer rate
- Strong WPA/WPA2 data encryption security
- 4 built-in 10/100Base-TX switch ports with auto MDI/MDIX support

**\$289** | U6165

DWA-547 RANGEBOOSTER N 650 WIRELESS LAN PCI ADAPTER | T9470 | \$139

DIR-655 Xtreme N Gigabit Router

- Draft 802.11n speeds up to 14x faster than Wireless G
- Greater coverage for your entire home or office
- Intelligent QoS technology for superior VoIP and online gaming
- Connect computers, game consoles, or media players to the Web

**\$289** | U5726

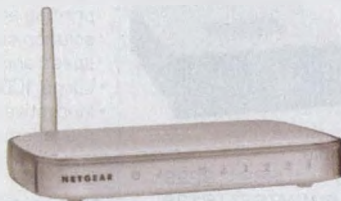
DWA-645 RANGEBOOSTER N 650 WIRELESS LAN PCMCIA CARD | T9472 | \$139

NETGEAR
Routers & Gateways

Not only do they work well, but they look terrific too. Inside our award-winning design you will find the range and coverage you need for today's demanding applications. Count on them for ease-of-use, quality, reliability and security.

WGR614 Wireless G Router + 4 Ports

- Faster speeds up to 54 Mbps in 2.4 GHz mode
- Share your Cable/DSL Internet connection with or without wires!
- Smart Wizard automatically detects and connects to your ISP
- True Firewall with SPI and NAT protection
- Easy setup with interactive installation tutorial

**\$79** | J2416**DG834G ADSL 2/2+ 54Mbps Wireless G ADSL Modem/Router**

- Combines modem, router, switch, 802.11g access point, and SPI True Firewall
- Up to 5X faster than 802.11b
- True Firewall with Stateful Packet Inspection (SPI) & Intrusion Control, Denial of Service (DoS), Virtual Private Network (VPN) pass-through

**\$135** | L2609

WG111 WIRELESS G WIRELESS USB ADAPTER | N6536 | \$39

WNR2000 WIRELESS N ROUTER

- Simple and secure way to share your high-speed Internet connection
- Works with older Wireless-G devices and new Wireless-N devices
- Push 'N' Connect securely connects at the touch of a button
- Use with a RangeMax Wireless-N Adapters and boost your performance and range

**\$119** | V9711**WNDR300 RangeMax Dual Band Wireless N Router**

- Surf, email, stream HD video, online game, make Internet phone calls – simultaneously
- More wireless channels, less interference and better connections using dual band Wireless N
- Wirelessly connect new devices easily and securely with Push 'N' Connect

**\$249** | V5257

Free Agent Go 250GB

- Easily store your photos, music, and other files
- Carry your data while you travel, or to and from work and home
- Quickly sync and back up at your desktop without having to search for cables
- Keep important files and folders private
- Get your storage solution up and running quickly
- Optional docking cradle sold separately

\$149 | W0333

320GB | W0335 | **\$179**
500GB | W0337 | **\$349**
Docking Cradle | W0337 | **\$29**
Seagate
NEW
Free Agent Desk 500GB

- Easily store and protect all your photos, music, videos and other files in one convenient place
- Automatically back up your data
- Keep your important files and folders private
- Sync your content between the FreeAgent Desk drive and other portable drives
- Get your storage solution up and running quickly

\$149 | W0339

1TB | W0340 | **\$249**
1.5TB Single Drive | W0341 | **\$299**
Seagate
NEW
Passport Essentials 320GB Pocket HDD

- High-speed USB
- Fits in your pocket
- PC and Mac compatible
- 3 Year Limited Warranty

\$149 | V6728 | **BLACK**
BLUE | V6876

RED | V6877

WD Western Digital
Passport Elite Titanium 320GB Pocket HDD

- Luxurious soft-touch finish
- Easy to grip, comfortable to hold, and beautiful to show off
- Automatic backup capabilities
- Capacity gauge

\$199 | V7358

WD Western Digital
Rugged 500GB Pocket HDD (USB only)

- Durable scratch protected aluminium shell and shock-resistant rubber bumper
- Hi-Speed USB 2.0
- Designed by Neil Poulton

\$299 | W0070

Also available:
320GB (USB & Firewire) | V5784 | **\$238**
LACIE
MyBook Essentials 1TB

- Windows 2000/XP/Vista and Mac OS X 10.4.8 (or later) compatible
- Easy to set up, easy to use
- USB 2.0 interface
- Instant storage
- SmartPower™

\$199 | V3265

Also available:
750GB | V3313 | **\$189**
WD Western Digital
MyBook Studio 1TB

- Easy to setup and easy to use
- FireWire 400/800 & eSATA connectivity
- Automatic backup capabilities
- Designed to work with your MAC

\$379 | V5991

Also available:
2TB Studio II Dual Drive with E-SATA | V9527 | **\$599**
WD Western Digital
MyBook Mirror 2TB Dual Drive

- RAID mirroring technology for ultimate data protection
- Automatic software backup
- Capacity gauge

\$549 | W0063

Also available:
1TB | W0328 | **\$269**
WD Western Digital
Slim Portable 8x DVD±RW with LightScribe

- USB bus-powered
- Double layer DVD technology
- LightScribe labelling software [Windows]
- Easy Media Creator Suite 9 burning software [Windows]

\$129 | V2283

Also available:
D2 Desktop | V1814 | **\$169**
D2 Next Desktop | V2267 | **\$129**
LACIE
Blu-ray Writer

This writer is the all-in-one solution for anyone wanting to create high quality content for Blu-ray Disc, DVD or CD. Offering revolutionary 4x burning speed, it can create a full BD-R 25GB disc in around 25 minutes.

\$429
U8692
Delivery only
Also available:
BR-COMB | U8691 | **\$229**
EXT DVD RW | V7635 | **\$129**
INT DVD RW | V7636 | **\$64.95**
PIONEER
2000i CD/DVD Duplicator

- Professional digital printing and publishing solution combining speed and reliability
- Large 100-disc input
- Innovative ink management system

\$5499 | W0074

RIMAGE
HOT DEALS on USBs

	SONY Microvault Click	SONY Turbo Click	SanDisk Cruzer U3	SanDisk Cruzer Titanium	SanDisk Cruzer Contour
4GB	V7499 \$33.95	V7662 \$39.95	U8760 \$29.95	U8762 \$39.95	-
8GB	V7498 \$57.95	V7663 \$72.95	V2315 \$49.95	V6856 \$69.95	U8758 \$79.95
16GB	V7497 \$99	-	V9111 \$99.95	-	V6855 \$129

ReadyNas Pro 1.5TB Desktop NAS

- Data protection with auto RAID management and online volume expansion
- Works with Windows®, Mac®, and Linux® clients across the network
- Dual Ethernet failover design for high availability
- iSCSI for compatibility with Microsoft Exchange and database servers

\$3099 | W0318 | RENT \$28.51/wk*
3 TB | W0320 | \$4299 | RENT \$38.32/wk*
6 TB | W0321 | \$6599 | RENT \$55.11/wk*

NETGEAR



NEW



StorageWorks External RDX 160 Removable Disk Backup System

- Affordable and rugged data protection solution
- Fast disk based performance
- Ability to store 160GB or 320GB of data on a single removable disk cartridge
- Drag and drop file access
- Includes 'hands free' HP RDX continuous data protection software
- Long lasting removable disk cartridges

\$549 | W0204
160GB Cart | W0346 | \$349
320GB Cart | W0347 | \$579



NEW

ReadyNAS™ Duo 500GB Intelligent NAS for Digital Media

- Compatible with SATA and SATA II HDD
- Hot swappable and lockable trays
- Ethernet Gigabit
- 3 USB 2.0 ports
- Embedded BitTorrent™ client for direct downloading from the internet

\$579 | V5249 | RENT \$5.46/wk*

NETGEAR



ReadyNAS™ NV+Gigabit Desktop NAS

- Perfect NAS for small office and home office
- Patent pending X-RAID™ technology
- Hot swappable
- Small 8" high desktop design

NO DISK | V1246 | \$1389
1TB 4 DISKS | U8794 | \$1449
2 TB 2 DISKS | V5008 | \$2399

NETGEAR



ReadyNAS™ 1100 Dual Gigabit Rackmount NAS

- 2 Gigabit interfaces
- RAID technology
- 4 Hot Swap SATA disks
- 12" deep 1U

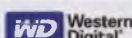
3 TB | U8818 | \$3900
4 TB | V4971 | \$6399



4TB ShareSpace Desktop NAS

- Accessible from anywhere
- Small-footprint, 4-Bay system
- Cool, quiet and eco-friendly: Includes WD GreenPower™ drives

\$1399 | W0158 | RENT \$13.20/wk*
 Also available:
2TB | W0361 | \$699 | RENT \$6.59/wk*



1TB Big Disk Gigabit Ethernet Mini External HDD

- Gigabit Ethernet and USB 2.0 interface
- Expandable capacity through a USB host port
- User and share level permissions

\$479 | U5309



1TB LinkStation Mini BUFFALO

- Massive 1TB capacity in the palm of your hand
- Dual drive
- Included DLNA server
- Support for RAID 0 and RAID 1
- Quiet fan-less design

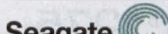
\$699 | W0348 | RENT \$6.59/wk*



1TB SATA Internal Hard Drive Upgrade Kit

- Fast performance
- SATA 3 Gb/s and NCQ interface
- 32MB Cache, 5 Year Warranty

\$219 | W0206



REDUCED \$80



DNS-313 1-Bay SATA NAS Enclosure

- Power management to conserve energy and extend life of hard drive
- Easy to use, manage by your web browser
- Secure and share your digital files
- Access stored files over the internet.

\$189 | V5002
DNS-323 2 Bay U4955 | \$349



NAS200 2-Bay Enclosure

- Easily add storage space onto your network with two SATA hard drive bays
- Add extra storage with two USB 2.0 ports
- Share files locally or through the Internet from any PC

\$199 | V0668



Australia's largest range of backup drives and media

Ultrium LTO Data Cartridge C7972A 400GB

- High capacity data cartridge to store & restore data for backup & archival
- LTO Generation 2
- 400GB compressed capacity

\$49 | H0334



StorageWorks DAT 160 USB External Tape Drive

- Highest capacity and performance DAT drive
- 160GB compressed data per cartridge at 50GB/hr
- USB 2.0
- Plug-and-play connectivity enabling backup in less than 60 seconds

\$999 | V5039



*For terms and conditions, including RentSmart, see back page of catalogue.

Dragon Naturally Speaking Ver 10

- New UI look and feel
- Improved help system and tutorials
- Quick voice formatting
- Improved natural commands for Mozilla Firefox
- Regional accent support

\$149 | V9754



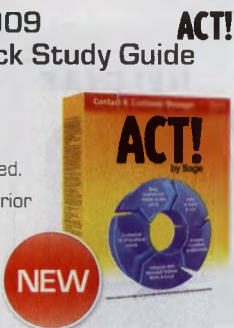
Software

ACT! by Sage 2009 + Free ACT! Quick Study Guide

Renowned for its ease of use, ACT! helps business professionals all over the world connect and succeed.

- New and improved superior Outlook integration
- Enhanced performance

\$279 | W0071



Total User Protection 2009 – 3 User

- Ultimate, easy-to-use PC and online protection with powerful website safety advisor

\$119 | V9730



TurboCAD 15 Deluxe

- All-purpose CAD program for all home and office projects
- Create precision 2D drawings, intricate 3D models
- Utilise powerful photorealistic rendering tools to present your ideas
- Includes symbols and 200 + 2D training lessons

\$179 | V7568



Acrobat 9 Pro

- Create and reliably share PDF documents
- Convert email to PDF
- Insert video in PDF files

\$589

WIN | V8278
MAC | V8279



CS3 Design Standard 3.3

- Great for page layout, image editing, illustration and Adobe PDF workflows

\$1879 | V8452
DESIGN PREMIER | V8445 | \$2846



AutoCAD LT 2009 – New Seat

AutoCAD LT is a powerful solution for designers who need full DWG™ native file format compatibility without 3D capabilities or advanced customisation. Increase efficiency with an updated user interface that not only accelerates routine tasks, but also makes commands easier to find, helping new users become productive as quickly as possible. Working with layers is now easier than ever. Move to new heights of productivity with AutoCAD LT software.

\$1869 | V6844

BONUS Training Book – AutoCAD + AutoCAD LT Bible 2009 valued at \$69.95¹



AutoCAD 2009 – New Seat

New innovative features simplify working with layers and help make new users productive as quickly as possible. Easy-to-use navigation tools make finding your way around 3D models a snap. Move to new highs of productivity with AutoCAD software.

\$6197 | V6845

BONUS Training Book – AutoCAD + AutoCAD LT Bible 2009 valued at \$69.95¹



QuarkXPress V8 Full Seat

QuarkXPress® 8 delivers superior page-layout and design power through an intuitive interface, print, Web, and Flash® authoring tools, and designer-driven typography. Push creativity to its limits. Xperience Design!

\$1275 | W0098
QUARK 8 UPGRADE | W0099 | \$472



Your Software Licensing Solution Specialist

Microsoft Volume Licensing

Microsoft Open License is a Volume Licensing program for small to midsize organizations that have fewer than 250 desktop PCs. The program provides a simple, flexible, and cost-effective way to acquire the latest Microsoft technology to meet your organisation's needs and procurement procedures.

Benefits of Open License

- A minimum purchase of just five licenses.
- Discounts off the retail price of software.
- A one-time transaction, so that you can pay at the time you purchase software.

- The rights to create a standard image and deploy it on multiple machines, and rights to transfer licenses from one machine to another.
- The ability to obtain licenses from multiple locations through a worldwide reseller channel.
- The ability to track and manage licenses by using online tools.
- Access to Microsoft Software Assurance, an enhanced maintenance program that helps you get the most out of your software investment.
- A single authorisation identification number that can be shared with qualified affiliate organisations.

Open Business Options

Open Business is ideal for organisations that want to pay for software licenses as they need them. This option helps give your organisation the flexibility to grow as your business needs increase.



Microsoft
CERTIFIED
Partner

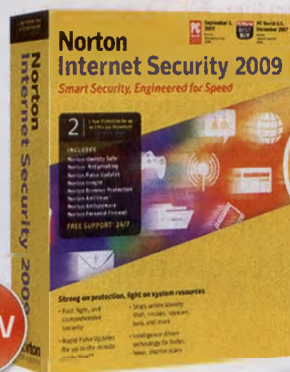
¹Bonus AutoCAD training book via redemption from Scholastic, offer valid from 01/09/08 until 30/10/09.

Norton Internet Security 2009 2 User Re-Engineered For Speed

Rapid install (averaging less than 1 minute) that uses less than 10MB memory and only 100MB of disk space. Also comes with a new silent mode for games and movies. Up-to-the-minute protection against identity theft, spyware, viruses, spam, bots, key loggers and new threats.

\$89⁹⁵ | 2 USER | W0101

BONUS Save and Restore



Also available:

\$99.95 | 3 USER | W0102

\$149 | 5 USER | W0103

Accounting V18

- Streamline your accounts procedures with this integrated business and inventory management software for sole traders
- Have your ABN automatically entered on all necessary invoices and forms



\$339 | W0081

Accounting Plus V18

- Calculates and tracks PAYG withholdings; long service, annual, holiday and sick leave; superannuation; and other employee entitlements and expenses
- Print payslips and pay cheques
- Lodge pays and payment summaries electronically
- Allocate pay items to multiple jobs.



\$579 | W0083
MYOB ACCOUNT EDGE
FOR MAC V8 | W0096 | **\$595**

Accounting Premier V12

- Manage even the most complex medium-sized business
- Get the complete set of business management features as found in MYOB Accounting Plus and also handle transactions and accounts in multiple currencies
- Multiple people can access your business information at the same time
- 1 year access to software support and upgrades



\$1449 | W0085

QuickBooks Plus 2008/09

- Payroll management
- Track and manage inventory
- Track GST and lodge BAS online
- Process credit card payments
- 12 months free technical phone support
- 12 months free for product upgrades
- Free phone installation support

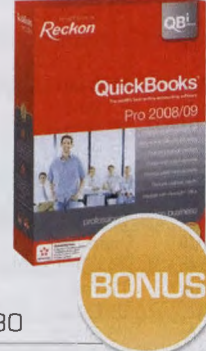


\$579 | FULL | V6177

BONUS \$100 Fuel Card[^]

QuickBooks Pro 2008/09

- Measure time billing and job costing
- Design and customise forms
- Integrates with MS Office and Outlook
- Integrated payroll management
- 12 months free technical phone support and upgrades



\$849 | FULL | V6180

BONUS \$150 Fuel Card[^]

QuickBooks Premier 2008/09

- Multi-user access
- Industry specific editions
- Advanced reporting tools
- Measure time billing and job costing
- Integrate with Microsoft Office[®]
- 12 months free technical phone support and upgrades

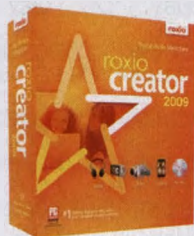


\$1399 | FULL | V6183

BONUS \$200 Fuel Card[^]

Easy Media Creator V11 + Bonus 1.5" Photo Frame Keyring

- Convert audio and video files to the format of your choice right on your Windows Vista[™] desktop
- Send videos to YouTube[™] with one click
- Save tons of time by ripping CDs from multiple drives.



\$149 | W0089

Paint Shop Pro Ultimate x2

New Features

- New Raw Lab with support for over 170 cameras
- Windows Vista[™] Certified

Valuable extras

- 2 GB USB flash drive
- Media recovery software that retrieves lost photo, video and sound files from reformatted memory cards



\$199 | V9710

Video Studio Pro x2 Ultimate

- Full standard and HD editing
- Pro audio tools
- Unique special effects
- DVD Blu-ray playback



\$219 | W0068

¹Cashbacks and bonuses available by redemption from supplier. Postage and conditions apply. ²For non-commercial use only.

[^]Bonus Fuel Card by redemption from Reckon between 28/08/08 and 31/10/08.

Inks & Toners

No 2 Ink Cartridges



\$137⁸ EA

T1635 | Cyan
T1634 | Magenta
T1636 | Yellow
T1637 | Light Cyan
T1639 | Light Magenta

88 Large Black Ink Cartridge



\$57⁹⁵

| T3790

Canon PGI-5 Black Ink Cartridge Twin Pack



\$42⁹⁸

| V2202

Canon CLI-8 Black and Colour Inks + PGI-5 Black Ink Cartridges Value Pack



\$129

| W0076

Harris Technology has a wide range of ink toner and paper consumables at competitive prices from all leading brands. Shopping for your consumables is easy with ht. Visit ink.ht.com.au



INKS

HT Part Vendor Part Colour



70165	C4844AA	10 Black	\$59.95
T3790	C9396A	88 Black - Large	\$57.95
Q1870	C9363WA	97 Tri-Colour	\$59.95
Q1680	C8765WA	Black	\$35.95
T1633	C8721WA	Black	\$31.95
Q1677	C8767WA	96 Black - High Volume	\$53.95
Q1676	C8766WA	95 Tri Colour	\$39.95
U8950	C4936A	18 Black	\$32.95
T0852	C9351AA	21 Black	\$25.95
22643	51645AA	45 Black	\$52.95
V1604	CC629AA	56/57 Twin Pack	\$64.88
T3789	C9393A	88 Yellow - Large	\$41.95
T0853	C9352AA	22 Tri Colour	\$29.95
T3786	C9391A	88 Cyan - Large	\$41.95
T7733	C9364WA	98 Black	\$29.95
T3787	C9392A	88 Magenta - Large	\$41.95
S2199	C6656AA	56 Black	\$32.95
S3034	C6578DA	78 Tri-Colour	\$56.95
B1729	C4837AA	11 Magenta	\$54.95
C6899	C4943A	83 UV Yellow	\$421.00
B1725	C4836AA	11 Cyan	\$59.98
G0251	C8727AA	27 Black	\$32.95
T1636	C8773WA	02 Yellow	\$13.78
U8951	C4939A	18 Yellow	\$24.95
T1634	C8772WA	02 Magenta	\$13.78
T1658	C9361WA	93 Tricolor	\$32.95
B8508	C4810A	11 Black	\$59.95
T1635	C8771WA	Cyan Ink	\$13.78
U1023	SA307AA	94/95 Combo Pack	\$60.95
B1728	C4838AA	11 Yellow	\$59.98
U8954	C4937A	18 Cyan	\$24.95
A2595	C6615DA	15 Black	\$48.95
97335	C6578AA	78 Tri-Colour	\$99.95
F9886	C6657AA	No 57 Tri-Colour	\$45.01
U8952	C4938A	18 Magenta	\$24.95
T1659	C9362WA	92 Black	\$25.95
U8497	CC620AA	56 Black	\$58.95
T1639	C8775WA	02 Light Magenta	\$13.78
V2813	CB336WA	74XL Black	\$51.95
Q1679	C9369WA	99 Tri-Colour Photo	\$43.95
C5155	C4811A	11 Cyan	\$59.98

LEXMARK

E0842	10N0016	16 Black	\$47.99
V2741	TPANZ02	27 Colour & # 17 Black Hi-Res	\$52.00
U8388	TPANZ09	32 & 33 Twin Pack Cartridge	\$42.00
P7483	18C0034	34 Black	\$42.00
P7484	18C0035	35 Colour Print	\$50.00
F1662	18L0032	82 Photo Black	\$49.00
F1664	18L0042	83 Photo Colour Cartridge	\$54.00
V0909	18Y0144A	Black	\$43.00

Price

HT Part Vendor Part Colour

EPSON

T7644	C13T04920BP	T049 Ink Bundle & 50 Sheet Photo Paper Pack	\$87.50
M0952	C13T049190	T0491 Black	\$19.95
N9690	C13T054290	T0542 Cyan	\$22.95
N9692	C13T054390	T0543 Magenta	\$22.95
S3494	C13T059690	T0596 Light Magenta	\$22.95
N9686	C13T054890	T0548 Matte Black	\$19.95
N9694	C13T054490	T0544 Yellow	\$22.95
U5322	C13T081190	T0811 Hi-Capacity Black	\$27.95
M1055	C13T049590	T0495 Light Cyan	\$19.95
M1063	C13T049490	T0494 Yellow	\$19.95
S3493	C13T059590	T0595 Light Cyan	\$22.95
S3350	C13T059490	T0594 Yellow	\$22.95
N9687	C13T054190	T0541 Photo Black	\$19.95
N9707	C13T054990	T0549 Blue	\$22.95
M1060	C13T049690	T0496 Light Magenta	\$19.95
96455	C13T007091	T007 Black	\$32.95
N9706	C13T054790	T0547 Red	\$22.95

brother

U1087	LC-57BK	LC-57BK Black	\$32.95
T7161	LC-47CL3PK	47 Colour Value Pack	\$46.95
U1088	LC-57C	57C Cyan	\$18.95
U1090	LC-57Y	LC-57Y Yellow	\$18.95
U1089	LC-57M	LC-57M Magenta	\$18.95
T7160	LC-47BK2PK	LC-47BK Black Ink Twin Pack	\$55.95

SAMSUNG

F5233	INK-M40	Black	\$55.00
D8975	INK-M10	Black	\$79.00

Canon

T4497	CLI8VP	CLI8VP Value pack 1x CLI8BK/C/M/Y & 240 sheets Paper	\$88.00
S9562	PGI5BK	PGI5BK Black	\$24.95
V7325	CLI8VP II	CLI8VP II Value pack 1x CLI8BK/C/M/Y & 250 sheets Paper	\$96.00
S9564	CLI8M	CLI8M Magenta	\$26.95
S9565	CLI8Y	CLI8Y Yellow	\$26.95
S9563	CLI8C	CLI8C Cyan	\$26.95
H8779	BCI15BK	BCI15BK Black	\$25.95
V2202	PG15BK-TWIN	PG15BK-Black InkTank - 2 Packs	\$42.95
R9653	BCI16C	BCI16C Colour	\$44.95
81586	BCI3EBK	BCI3eBK Black	\$22.95
S9587	CLI8BK	CLI8BK Black	\$26.95
C3428	BCI6Y	BCI-6Y Yellow	\$24.95
C3426	BCI6M	BCI-6M Magenta	\$24.95
S7128	PG40	PG-40 Black	\$37.95
C3424	BCI6C	BCI-6C Cyan	\$24.95
C3420	BCI6BK	BCI-6BK Black	\$24.95
S9213	CL41	CL-41 Tri Colour	\$39.95
W0076	CLI8PLUS	CLI8 BK/C/M/Y PGI5 BK	\$129.00
W0078	BCI6PLUS	BCI6 BK/C/M/Y BCI3 BK	\$99.00

TONERS

HT Part	Vendor Part	Colour	Yield	Price	HT Part	Vendor Part	Colour	Yield	Price
HP									
N8600	Q3964A	Drum	20,000 Bk / 5,000 Clr	\$289.00	LEXMARK				
L0381	Q2612A	Black	2,000	\$96.00	T7314	12017SR	Black	2,000	\$109.00
S5168	Q6000A	Black	2,500	\$99.00	T9775	X340H11G	Black	6,000	\$192.00
N8595	Q3960A	Black	5,000	\$149.00	U2318	C5220KS	Black	4,000	\$153.00
P9323	Q5949X	Black	6,000	\$219.00	L5690	18S0090	Black	3,200	\$109.00
U4730	Q7553X	Black	7,000	\$226.00	U2427	C5220CS	Cyan	3,000	\$175.00
S5170	Q6001A	Cyan	2,000	\$139.00	N5852	20K1400	Cyan	6,600	\$352.00
S5171	Q6002A	Yellow	2,000	\$139.00	U0636	64017HR	Black	21,000	\$482.00
S5172	Q6003A	Magenta	2,000	\$139.00	U2408	C5220YS	Yellow	3,000	\$175.00
T3958	Q6470A	Black	6,000	\$219.00	N5855	20K1403	Black	10,000	\$260.00
N9528	Q3962A	Yellow	4,000	\$169.00	U5909	E250A11P	Black	3,500	\$155.00
N9532	Q3963A	Magenta	4,000	\$169.00	U2374	C5220MS	Magenta	3,000	\$175.00
N9527	Q3961A	Cyan	4,000	\$169.00	T6319	24017SR	Black	2,000	\$95.00
Q4124	Q5942X	Black	20,000	\$349.00	N5853	20K1401	Magenta	6,600	\$352.00
V0121	CB436A	Black	2,000	\$121.00	KONICA MINOLTA				
U4729	Q7553A	Black	3,000	\$123.00	R0703	1710590-004	Black	4,500	\$154.00
D0031	C7115X	Black	3,500	\$129.00	R0707	1710590-007	Cyan	4,500	\$219.00
G7580	Q1338A	Black	12,000	\$234.00	R0706	1710590-006	Magenta	4,500	\$219.00
Q4123	Q5942A	Black	10,000	\$229.00	R0704	1710590-005	Yellow	4,500	\$219.00
Q4121	Q6511X	Black	12,000	\$349.00	F8852	1710517-005	Black	4,500	\$145.00
T4556	Q7560A	Black	6,500	\$205.00	M0897	1710567-003	Black	6,000	\$169.00
T3959	Q6471A	Cyan	4,000	\$211.00	R9462	1710591-001	Drum	45,000	\$222.00
U5333	Q7551X	Black	13,000	\$333.00	F8855	1710517-008	Cyan	4,500	\$219.00
C0249	C8061X	Black	10,000	\$199.00	R7833	1710605-006	Yellow	12,000	\$414.00
Q4118	Q6511A	Black	6,000	\$199.00	R7835	1710605-008	Cyan	12,000	\$414.00
T3960	Q6472A	Yellow	4,000	\$211.00	R7834	1710605-007	Magenta	12,000	\$414.00
G8259	C9733A	Magenta	12,000	\$480.00	F8853	1710517-006	Yellow	4,500	\$219.00
P9322	Q5949A	Black	2,500	\$119.00	F8854	1710517-007	Magenta	4,500	\$219.00
F1352	C9720A	Black	9,000	\$239.00	FUJI XEROX				
U0150	Q7516A	Black	12,000	\$299.00	T3238	CWAA0649	Black	2,500	\$74.95
73192	C4096A	Black	5,000	\$169.00	R6900	CT200649	Black	4,000	\$129.00
T3961	Q6473A	Magenta	4,000	\$211.00	R6904	CT350390	Drum	42,000	\$288.00
G8257	C9732A	Yellow	12,000	\$480.00	M0980	113R00628	Black	15,000	\$396.00
U4777	Q7551A	Black	6,500	\$209.00	R6903	CT200652	Yellow	4,000	\$199.00
T4643	Q7561A	Cyan	3,500	\$197.00	R6901	CT200650	Cyan	4,000	\$199.00
G8256	C9731A	Cyan	12,000	\$480.00	SAMSUNG				
61686	C4129X	Black	10,000	\$249.00	V0475	CLP-P300C	B/C/M/Y /CLR	B: 2,000 1,000	\$249.00
T4647	Q7581A	Cyan	6,000	\$266.00	T6647	SCX-4521D3/SEE	Black	3,000	\$125.00
G8255	C9730A	Black	13,000	\$342.00	J9853	SCX-4216D3	Black	3,000	\$125.00
Canon					T0776	ML-2010D3/SEE	Black	3,000	\$125.00
advanced simplicity					J2380	ML-1710D3	Black	3,000	\$125.00
S7054	FX9	Black	2,000	\$149.00	U0652	CLP-K300A/SEE	Black	2,000	\$99.00
Q6538	CARTU	Black	2,500	\$119.00	M9755	CLP-500D7K	Black	7,000	\$159.00
T6876	CART308	Black	2,500	\$100.00	S2534	CLP-510D7K/SEE	Black	7,000	\$179.00
S1818	CART303	Black	2,500	\$109.00	T6648	SCX-D4200A/SEE	Black	3,000	\$125.00
T6877	CART308II	Black	2,500	\$189.00	M9756	CLP-500D5C	Cyan	5,000	\$179.00
L7104	EP26CART	Black	2,500	\$129.00	S2538	CLP-510D5Y	Yellow	5,000	\$189.00
S6944	CART301D	Drum	-	\$299.00	S2536	CLP-510D5C	Cyan	5,000	\$189.00
S1412	CART301BK	Black	5,000	\$149.00	M9758	CLP-500D5Y	Yellow	5,000	\$179.00
B7989	EP-22CART	Black	2,500	\$109.00	M9757	CLP-500D5M	Magenta	5,000	\$179.00
S1414	CART301C	Cyan	4,000	\$159.00	S2537	CLP-510D5M	Magenta	5,000	\$189.00
S1416	CART301M	Magenta	2,000	\$169.00	U0655	CLP-Y300A/SEE	Yellow	1,000	\$79.00
J2823	EP87D	Drum	-	\$269.00	brother				
S1418	CART301Y	Yellow	4,000	\$169.00	at your side				
R7305	TN-2025	Black	2,500	\$77.00	brother				
T3576	TN-3185	Black	7,000	\$129.00	at your side				
V0453	TN-155Y	Yellow	4,000	\$190.00	brother				
V0450	TN-155M	Magenta	4,000	\$190.00	at your side				
N1558	TN-3060	HL5140/ 5150D/ 5170DN/ 8840/ 8440 6700 YIE	6,700	\$149.00	brother				
V1374	TN-155C	Cyan	4,000	\$190.00	at your side				
M9543	TN-04BK	Black	10,000	\$249.00	brother				
S2372	DR-2025	Drum	-	\$149.00	at your side				
M9544	TN-04C	Cyan	6,600	\$249.00	brother				
C6970	TN-7600	Black	6,500	\$127.00	at your side				
V1733	TN-155BK	Black	5,000	\$143.00	brother				

brother
at your sideTN-2025
Black Toner
Cartridge

\$77

R7305

LaserJet 12A
Toner
Cartridge

\$96

L0381

SAMSUNG

CLP-P300C
Black and
Colour Toner
Cartridge
4 Pack

\$249

V0475

GREAT RANGE
BIG BRANDS,
INK & TONER

NEW One 3.5" GPS

- The NEW TomTom One is a portable navigation device that is easy to use and has the latest maps and technologies
- New ultra compact pocketable design with 3.5" touch screen maximises portability
- Crystal-clear 3D graphics with pre-loaded Whereis V15 2008 mapping on 1GB internal memory
- Loud and clear voice instructions guide users on their journey, including text-to-speech street names
- Provides users with speed camera warnings

Was \$349
\$299 | V8490



TOMTOM

GO 930 GPS

- Stylish and slim design with an extra-wide 4.3" touch LCD screen and built-in FM transmitter with MP3 Playback and iPod connectivity
- The ultimate device for an avid traveller providing crystal-clear 3D graphics and points of interest worldwide on 4GB of internal memory
- Provides latest maps for Australia, New Zealand, Europe and North America encompassing 45 countries
- Features enhanced positioning technology for uninterrupted navigation in tunnels and built up areas

\$849 | V9249 | RENT \$8.00/wk*



TOMTOM

S30 3.5" GPS

- The Navman S30 is a slim and light pocket-sized device, providing drivers with a user-friendly interface that is easy to use
- Features a 3.5" touch screen that displays the latest comprehensive maps Australia wide from SensisWhereis
- The Navman S30 is preloaded with the latest speed and red light camera information, providing users with audible and visual alerts
- Includes a vast list of places of interest such as accommodation, places to eat, attractions, shopping, leisure activities, and much more

\$299 | V1308

Navman latest map guarantee - Upgrade to 2008*



NAVMAN

S90i 4.3" Widescreen GPS

- The Navman S90i is a slim and light pocket-sized device, providing drivers with a user-friendly interface that is easy to use
- Features a 4.3" touch screen that displays the latest comprehensive maps Australia wide from SensisWhereis
- Features a 2 megapixel integrated NavPix camera, so users can take NavPixs to upload and share with others
- Text-to-speech feature enhances audible directions providing easy guidance to locations

\$549 | V1313

Navman latest map guarantee - Upgrade to 2008*



NAVMAN

Touch II Smartphone

- HTC Touch revolutionises the touch screen experience by allowing finger scrolling and panning
- Windows Mobile 6 Professional allows users to send and receive emails and access Microsoft Office documents while on the move
- Optimised for entertainment, the HTC Touch allows users to enjoy music and videos on the move
- 2.8" high-resolution LCD touch-sensitive screen allows for an optimised internet browsing experience
- Take photos of family and friends with 2.0 megapixel camera
- Bluetooth 2.0 and Wi-Fi enabled

Was \$699
\$499 | V4446

PRICE DROP



htc
smart mobility

Touch Diamond

- The HTC Touch Diamond is compact in size and features a 2.8" touch TFT-LCD display, within a stunning formation of brushed steel and flawless faceted edges
- Features a vibrant touch-responsive user interface, TouchFLO™ 3D and ultra-fast HSDPA internet connectivity
- With TouchFLO™ 3D, users are able to add album artwork to their music, access videos and add photos to their contacts
- A 3.2 megapixel auto-focus camera will help users capture the perfect moment in style and 4GB of internal storage allows users to store all files
- Integrated GPS allows users to find their destination
- Bluetooth and Wi-Fi (802.11b/g) enabled

\$999 | V7839 | RENT \$9.41/wk*

NEW



htc
smart mobility

3355 Cordless Phone and Answering Machine

- WDECT is a Wideband digital technology which delivers increased clarity, range and security
- Divert all calls to the integrated Digital Answering Machine by using the Do Not Disturb feature
- Orange backlit LCD Display and keypad enables easy use in all light conditions
- Talk Time: 7 hours
- Standby Time: 10 days

\$169 | U9321
Includes 2 extra handsets



Uniden
SOUNDS BETTER

WDECT

7955 Cordless Phone and Answering Machine

- Premium 5.8GHz Digital Spread Spectrum Cordless Phone system offers optimum clarity
- Backlit LCD display on handsets and answering machine provides easy viewing during the day and night
- Diverts all incoming calls directly to the integrated digital answering machine by using the Do Not Disturb feature
- Wi-Fi capabilities allow users to operate up to 10 handsets, without interference to any other wireless networks
- Talk Time: 5 hours
- Standby Time: 7 days

\$219 | U9325
Includes 1 extra handset



Uniden
SOUNDS BETTER

5.8 DIGITAL

CanoScan LiDE 200 Scanner

Canon
advanced simplicity

- A fast, high quality scanning for those with no time to waste.
- Contact image sensor
- 4,800 x 4,800 DPI optical resolution
- 14 second A4 scan
- 4 one-touch buttons (scan, copy, PDF file, email)
- Connection: Hi-Speed USB 2.0
- Power supply via USB port (additional power cord not required)
- RGB three-colour LED light source
- Advanced Z-Lid and upright scanning



\$149 | V9623

Also Available:
CanoScan 5600F Scanner | V9628 | \$249
CanoScan 8800F Scanner | V4265 | \$349

GT-1500 Flatbed Document Scanner with ADF

EPSON

- 1200 x 2400 scan DPI
- 40 sheet ADF
- ReadyScan LED technology
- 18 PPM (using ADF)
- 48 Bit colour depth
- Three-line optical CCD
- 4 one-touch buttons



\$599

V7997 | RENT \$5.64/wk*

Also Available:
Perfection V500 Photo Scanner | V2206 | \$469
Perfection V700 Photo Scanner
T6629 | \$859 | RENT \$8.10/wk*

ScanMate i1120 Duplex Scanner

Kodak

- Smart touch scanning with Perfect Page and iThresholding
- Bitonal/grayscale/color: Up to 20ppm/40ipm
- 50 sheet automatic document feeder (ADF)
- Create single and multi-page TIFF, JPEG, RTF, PDF and searchable PDF
- Includes: Nuance Scansoft PaperPort 11, Nuance Scansoft OmniPage 15 and Presto!BizCard5



\$599 | V9283
RENT \$5.64/wk*

Also Available:
i1220 A4 Duplex Document Scanner
U1271 | \$1249 | RENT \$11.77/wk*
i1320 A4 Duplex Document Scanner
U0857 | \$3099 | RENT \$28.51/wk*

DYMO

LabelManager 210D - Desktop



\$89
V5450

LabelManager 220P - Handheld



\$99
V5451

LabelWriter 400



\$149
U8563

LabelWriter 400 Duo



\$399
U8565

CardScan Executive v8

CardScan

- Scans in colour in about 3 seconds
- Reads 7 languages
- Captures information from email, web pages and other electronic files (Not just business cards!)
- Works with Outlook, Palm, Windows mobile, smart phones plus ACT!, Lotus Notes and GoldMine



\$339 | U2695

Also Available:
CardScan Team V8 | V1250 | \$399

DS1 Cross Cut Shredder with Safe Sense

Fellowes

- Shreds up to 11 sheets
- Safe sense technology - immediately stops shredding when touched
- Confetti cut particles for extra security
- Also shreds credit cards, staples and small paper clips
- Auto start/stop feature ensures quick, easy shredder operation



\$199 | V0533

POS Solutions

QuickScan QS 2500 Handheld Scanner - USB



\$199 | V6971

Also Available:
Datalogic Magellan 1000i Omni-Directional Scanner - USB | T9226 | \$449
Cash Drawer CDY435 - Black | K0649 | \$199
Epson TM-T88IV-042 Docket printer - USB - Black | T7524 | \$599 | RENT \$5.64/wk*
MYOB RetailManager 10 | V3264 | \$1583
Quicken Retail Point of Sale Pro 2008/2009 | V8191 | \$729

C-220C Cross Cut Shredder

Fellowes

- Powerful shredder for 5 to 10 users
- High performance engineering enables continuous use for multiple users
- Turbo jam release button clears jams quickly and easily
- Fast shred speed (normally found on heavy-duty office machines)
- Large capacity removable bin for easier waste disposal
- Auto-stop on jamming with indicator and auto-reverse significantly lengthens product life
- User-friendly control panel maximises ease of use



\$999
V7996 | RENT \$9.41/wk*



Colour LaserJet CP2025N Laser Printer

Ideal for small and medium business, with small work teams of 1-8 users. Exceptional colour print quality and speed ensures productivity and ease of use.

- Print speed: 21ppm mono/colour
- Resolution: 600 dpi with ImageRet 3600
- PCL6 (discreet), PCL5 & PS 3 emulation (UPD)
- 128 MB RAM [expandable to 384 MB]; 540 MHz processor
- Connectivity: High-Speed USB 2.0, Integrated 10/100 onboard networking
- 250 sheet input tray, 50 multi-purpose tray (optional 250 sheet tray)

\$899 | V9564 | RENT \$8.47/wk*

Also available:

CP2025DN | V9565 | \$999 | RENT \$9.41/wk*

CP2025X | V9566 | \$1149 | RENT \$10.83/wk*



CLP-300 Colour Laser Printer

Whisper-quiet operation, the NO-NOISE engine design means the toner is stored in a fixed cartridge mechanism, eliminating noise and vibration. It also simplifies toner changes, there are no heavy toners to change, just small, easy-to-access toner bottles.

- Print speed: Up to 16ppm mono/4ppm colour
- Print resolution [colour]: 2400 x 600 dpi
- Total media capacity: 150 sheets
- Memory: 32MB
- Connection: Hi-Speed USB
- Monthly duty cycle: 24,200 pages
- 1 Year Onsite Warranty

\$169 | U4583

Also available:

CLP-350N Colour Laser Printer | V2270 | \$359



Laserjet P1006 Mono Laser Printer

- Print speed: 17ppm mono
- Connection: USB 2.0
- Memory: 8MB (Maximum)
- Processor: 266 MHz
- Resolution: 600 x 600 dpi
- Input Tray: 150 sheet, single-sheet priority feed slot
- Monthly duty cycle: 5,000 pages
- 1 Year Warranty

\$199 | V3595

Also available:

Laserjet P1505 Mono Laser Printer

| V3019 | \$299

Laserjet P2014 Mono Laser Printer

| V4327 | \$499



Phaser 8560DN FUJI XEROX Solid Ink Colour Printer

- Print speed: 30ppm colour/mono
- Connection: USB 2.0/Ethernet 10/100 Base TX
- Memory: 256MB (1GB Maximum)
- Processor: 600 MHz
- Resolution: Up to 2400 FinePoint
- Input tray: 525 sheet, 100 sheet multi purpose tray
- Monthly duty cycle: 85,000 pages
- 1 Year Onsite Warranty



\$500 TRADE IN*

NETWORK READY

\$1999 | U9155 | RENT \$18.86/wk*



CLP-610ND Colour Laser Printer

- Print speed: 20ppm colour/mono, 10ppm duplex colour/mono
- Connection: USB 2.0/Ethernet 10/100 Base TX
- Memory: 128MB (384MB Maximum)
- Processor: 360 MHz
- Resolution: 2,400 x 600 dpi
- Input tray: 250 sheet, 100 sheet multi purpose tray
- Monthly duty cycle: 65,000 pages
- 1 Year Onsite Warranty

\$649 | V6358 | RENT \$6.12/wk*

Also available:

CLP-660ND | V6360 | \$899 | RENT \$8.47/wk*



T644DN Mono Laser Printer

LEXMARK

- Print speed: 48ppm mono/18ppm duplex
- Connection: Parallel/USB/Ethernet 10/100 Base TX
- Memory: 128MB (640MB Maximum)
- Processor: 514 MHz
- Resolution: 1,200 x 1,200 dpi
- Input tray: 500 sheet, 100 sheet multi purpose tray
- Monthly duty cycle: 250,000 pages
- 2 Year Onsite Warranty

\$2499 | V8752

Also available:

T644N Mono Laser Printer

| V0455 | \$2199 | RENT \$20.75/wk*

T644DTN Mono Laser Printer

| T3887 | \$2999 | RENT \$27.60/wk*



NETWORK READY



HL-5250DN Mono Laser Printer

brother
at your side

- Print speed: 28ppm mono / 9ppm duplex
- Print resolution: 1200 x 1200 dpi
- Total media capacity: 300 sheets
- Memory: 32MB (expandable to 544MB)
- Connection: Parallel/USB 2.0/Ethernet 10/100 Base TX
- Duplex mode for dual sided printouts
- Monthly duty cycle: 20,000 pages
- 1 Year Warranty

\$399 | T3555

Also available:

HL-5270DN Mono Laser Printer

| T5554 | \$499

HL-7050N Mono Laser Printer

| J2055 | \$1099 | RENT \$10.36/wk*



NETWORK READY

PagePro 4650EN Mono Laser Printer

KONICA MINOLTA

- Print speed: 34ppm mono
- Connection: Parallel/USB 2.0/Ethernet 10/100 Base TX
- Memory: 128MB (384MB Maximum)
- Economical running costs
- Processor: 500 MHz
- Resolution: 1,200 x 1,200 dpi
- Input tray: 550 sheet, 150 sheet multi purpose tray
- Monthly duty cycle: 150,000 pages
- 1 Year Onsite Warranty

\$649 | V8895

BEFORE CASHBACK YOU PAY

\$799 | RENT \$7.53/wk*



\$150 CASHBACK*

NETWORK READY

*For terms and conditions including RentSmart see page 20. *Visit www.ht.com.au/ptype/printing_and_ink/promotion_list.htm for detail on the Cashback.

*Available from www.fujixeroxprinters.com.au

MFC-9440CN Colour Laser Multifunction

brother
at your side

This feature packed multifunction is network ready as standard making for an ideal solution for the business environment. Thanks to a direct print feature you can print documents from USB memory stick eliminating the need for a PC.

- Print/scan/copy/fax
- Print/copy speed: 20ppm colour/mono, 16ppm colour/mono
- First page out: <16secs mono
- Resolution: 2,400 x 600 dpi
- Processor: 300 MHz
- RAM: 64MB (576MB Maximum)
- Input tray: 250 sheets, 50 sheet multi purpose tray (35 sheet ADF)
- Monthly Duty Cycle: 35,000 Pages
- Connection: USB 2.0 / Ethernet 10/100 Base TX

BONUS#



NETWORK READY

\$1149 | V1797 | RENT \$10.83/wk*

BONUS 2 Year Onsite Next Business Day Warranty¹

Colour LaserJet CM1312NFI Multifunction



Prints so colourful you'll swear they came right off a printing press. Rely on this multifunction colour laser printer for consistent, high-quality results.

- Print/scan/copy/fax
- Print/copy speed: 12ppm colour; 8ppm mono
- First page out: <26secs mono, <32secs colour
- Resolution: 600 x 600 dpi, HP ImageREt 3600
- Processor: 450 MHz
- RAM: 160MB (Maximum)
- Input tray: 150 sheets (50 sheet ADF)
- Monthly duty cycle: 30,000 Pages
- Connection: USB 2.0/Ethernet 10/100 Base TX
- 1 Year Warranty



NETWORK READY

\$799 | V8012 | RENT \$7.53/wk*

LaserJet M1319F Multifunction



- Print/scan/copy/fax
- Print/copy speed: 19ppm mono
- First page out: <8.5secs mono
- Resolution: 1,200 x 1,200 dpi, HP Ret
- Processor: 240 MHz
- RAM: 32MB (Maximum)
- Input tray: 250 sheet, 10 sheet priority tray (30 sheet ADF)
- Monthly duty cycle: 8,000 pages
- Connection: USB 2.0



\$339 | V8821

MFC-7840W Wireless Mono Laser MFP

brother
at your side

- Printer/copier/scanner/fax
- Printing and copying speed: Up to 22ppm
- Print Resolution: Up to 600 x 600 dpi
- PC Connection: USB, Ethernet 10 Base-T/100 Base-TX, IEEE 802.11b, IEEE 802.11g
- Scan resolution: 600 x 2400 dpi
- 1 Year Warranty



NETWORK READY

\$549 | V7986

LaserJet M2727NF Multifunction



- Print/scan/copy/fax
- Print/copy speed: 27ppm mono
- First page out: <7secs mono
- Resolution: 1,200 x 1,200 dpi, HP Ret
- Processor: 264 MHz
- RAM: 64MB (320MB Maximum)
- Input Tray: 250 sheets (50 sheet ADF)
- Monthly duty cycle: 15,000 pages
- Connection: USB 2.0/Ethernet 10/100 Base TX



NETWORK READY

\$999 | V5431

RENT \$9.41/wk*

Also available

LaserJet M2727NFS Multifunction
V5437 | \$1199 | RENT \$11.30/wk*

OfficeJet Pro L7590 Multifunction



- Print/scan/copy/fax
- Print/copy speed: 35/34ppm mono/colour
- Resolution: 4,800 x 1,200 dpi
- Processor: 192 MHz
- RAM: 64MB (Maximum)
- Input tray: 250 sheets (50 sheet ADF)
- Monthly duty cycle: 7,500 Pages
- Connection: USB 2.0/Ethernet 10/100 Base TX



\$100 CASHBACK!

NETWORK READY

\$379 | V7713

BEFORE CASHBACK YOU PAY \$479

Pixma iX4000 Inkjet Printer

Canon
advanced simplicity

- Print borderless photos up to A3+
- Resolution: 4,800 x 1,200 dpi
- 4 individual ink tanks
- Connection: USB 2.0
- Print speed: 18ppm black/ 14ppm colour
- Capacity: 150 sheets
- 1 Year Warranty



\$539 | T9252

iP100 Portable A4 Printer

Canon
advanced simplicity

- Borderless printing up to A4
- Print speed: 20ppm black/ 14ppm colour
- Resolution: 9,600 x 2,400 dpi
- Battery life: Approx. 290 sheets
- Capacity: 50 sheets
- Connection: USB 2.0, infra-red, optional Bluetooth
- 1 Year Warranty



NEW

\$449 | V8497

*For terms and conditions including RentSmart see page 20. *Bonus via redemption from www.brother.com.au. *Cashback via redemption from HP.

harristechnology



**SAVE
\$200**

**NETWORK
READY**

**27 PPM
COLOUR**



KONICA MINOLTA

Magicolor 5440DL Colour Laser Printer

Colour laser printing has never been as fast or as convenient as this. With networking as standard, colour print speeds higher than most black and white printers, the magicolor 5440DL is one of the best value for money printers in its class. Not only does the printer come with revolutionary polymerised toner, it also can print up to 2400 x 600 dpi - making the quality of the prints outstanding!

\$499 | V8291



see page 09

SAMSUNG

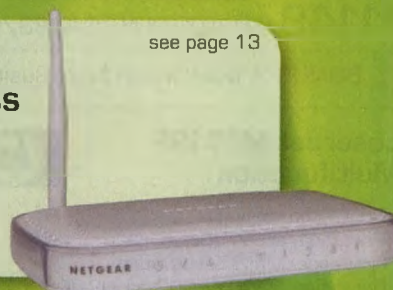
**Syncmaster
2253LW**

\$349 | V7479



**NETGEAR®
DG834G Wireless
ADSL Modem/
Router**

\$135 | L2609



see page 13



LS-21 Speakers

\$44⁹⁵ | V8369



see page 07

LOCATIONS

NSW | North Ryde | Ph: 8879 5130
45 Epping Rd
North Sydney | Ph: 8923 9410
G Floor Bayer Bldg
275 Alfred St
Alexandria | Ph: 8306 4210
Unit 1/110 Botany Rd

ACT | Fyshwick | Ph: 6126 3410
29-31 Townsville St

VIC | Hawthorn East | Ph: 9810 4610
612 Burwood Rd

QLD | Fortitude Valley | Ph: 3250 4110
356 St Pauls Tce
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254-256 Moggill Rd

WA | Osborne Park | Ph: 9208 0310
426 Scarborough Beach Rd
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1359 Albany Hwy

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RRP Inc-GST



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